



# **Chinese EFL Teachers' AI Literacy and Motivation for AI-Related CPD Activities: A Comparison Between Public and Private Schools**

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## Abstract

As artificial intelligence (AI) is revolutionizing education, bringing unprecedented opportunities yet reshaping teachers' roles, AI literacy has become essential for teachers to ensure effective, critical, and ethical integration of AI into teaching. Situated in four tier-1 mega-cities (Beijing, Shanghai, Guangzhou, and Shenzhen) in China, this study examined differences between public and private secondary school English teachers in AI literacy, the school support they receive for its development, and their motivation for AI-related CPD, and explored the relationships between these three areas. A mixed-method approach was used for a comprehensive understanding, combining an online-questionnaire (n=133 participants) and nine follow-up semi-structured interviews. Drawing on Ng et al.'s four-dimension conceptualization, teachers' AI literacy was assessed in terms of Knowing and Understanding AI (KUAI), Applying AI (AAI), Evaluating AI Application (EAIA), and AI Ethics (AIE). Three types of need-satisfaction support (competence, autonomy, and collegial support) and five types of motivation (amotivation, external, introjected, identified, and intrinsic) were also examined based on Ryan and Deci's (2020) Self-Determination Theory.

Quantitative findings revealed that public school teachers scored significantly higher than their private school counterparts in overall AI literacy, KUAI, EAIA, collegial support, overall motivation, and controlled motivation (external and introjected). Qualitative findings supported these disparities and highlighted the need for joint action from government and schools. Across school types, teachers reported relatively high levels of overall AI literacy, school support, and motivation for AI-related CPD, although qualitative data to some extent contradicted the results for the first two aspects. Teachers experienced most collegial support, and were largely motivated by autonomous motivation (identified and intrinsic). Significant positive correlations were consistently observed among the three domains, as well as among some of their sub-dimensions. These findings revealed the inequitable resource distribution between the two school types and the associated disparities in teachers' AI literacy, school support, and motivation for AI-related CPD, although caution is needed in interpreting the results. .

**Key words:** AI literacy, school support, motivation, Continuous Professional Development (CPD), Self-Determination Theory (SDT), public and private schools

## 1. Introduction

Artificial intelligence (AI) has become pervasive across industries, greatly influencing and even revolutionizing the field of education (Molefi et al., 2024; Ng et al., 2021). Its transformative potential has been demonstrated in a wide range of educational applications such as intelligent tutoring systems that enable adaptive and personalized learning experiences (Lukin & Holmes, 2016; Koraishi, 2025). Such transformative power has even sparked debates on whether human teachers will be replaced by AI (Selwyn, 2019), posing great challenges to teachers' role. Besides this, AI has brought up other challenges in education, including ethical concerns (Zaman, 2024), academic integrity (Chiu, 2023), and the potential to exacerbate inequities, particularly in under-resourced schools (Özer, 2024). In this light, only those teachers who can artfully manipulate this “magic tool” can survive and thrive in their transformed roles in the new era of AI (Xu, 2020), underscoring the urgent need for teachers to develop relevant abilities.

One response to this need is the development of various conceptualizations of AI literacy, a multidimensional and still emerging construct. For example, Long and Magerko (2020) define it as a set of competencies enabling individuals to critically evaluate AI technologies, collaborate effectively with AI, and use it across contexts, while Pinski and Benlian (2024) propose a two-dimensional model comprising five proficiency dimensions and six subject areas. Compared with these two comprehensive yet complex conceptualizations, Ng et al.'s (2021a, 2021b) four-dimension framework offers a more focused and manageable basis for empirical investigation in educational contexts, and thus is adopted by the present study. According to their conceptualization, AI literacy includes four dimensions: Knowing and Understanding AI (KUAI), Applying AI (AAI), Evaluating and Creating AI (ECAI), and AI Ethics (AIE).

However, subsequent research has placed greater emphasis on students' AI literacy, leaving teachers' AI literacy comparatively under-explored. The limited studies available suggest that teachers' AI literacy is generally low (Li et al., 2023; Yoon & Jang, 2024), with a lack of deep understanding of AI principles (Pei et al., 2025) and insufficient attention to AI ethics (Ayanwale et al., 2024; Sperling et al., 2024; Xu, 2020). While research specifically targeting language teachers is even more scarce, two recent studies indicate that AI literacy among language teachers may be at a moderate-to-high level (Wang & Pan, 2025; Ma et al., 2024), higher than that revealed in earlier studies. Such a difference may be related to

teachers' increasing exposure to AI in recent years, contextual differences, or the nature of this specific teacher group, underscoring the importance of investigating the current state of AI literacy among language teachers, English as a Foreign Language (EFL) teachers in particular for the present study, and in different contexts.

Continuous Professional Development (CPD), encompassing all formal and informal learning experiences that contribute to growth or development, is widely recognized as a key factor in improving teachers' development. Motivation is a decisive factor in determining whether CPD participation is effective (McMillan et al., 2016; Osman & Warner, 2020). According to Self-Determination Theory (SDT; Ryan & Deci, 2020), support for teachers' basic psychological needs for autonomy, competence, and relatedness can enhance motivation, particularly intrinsic motivation. Therefore, it is important to investigate both the need-satisfaction support teachers receive in their school contexts and their motivational profiles for AI-related CPD to better understand factors that encourage and hinder their CPD engagement.

However, research focusing on teachers' experiences in these areas remains limited. Existing studies on school support indicate that such support is often insufficient (Kohnke et al., 2025; Su et al., 2023), while the few studies on motivation for AI lack transparency in both methodology and presentation of results (e.g. Tang et al., 2025). Building on these and other research gaps identified, the present study then investigates three interrelated areas among EFL teachers: their AI literacy, the need-satisfaction support they receive, and their motivation for AI-related CPD.

The study is rooted in the context of Chinese public and private secondary schools, which, as evidenced by both policy documents and personal observations, differ substantially in a wide range of aspects including funding sources and access to educational resources. Public schools, being state-funded, generally enjoy more government budgets, greater policy support/regulation, and more formalized teacher training/evaluation systems, while private schools, being market-oriented, have greater flexibility but limited government support. When it comes to newly emerging trends or technologies like AI, these structural differences can result in great disparities between two types of school. For example, in recent years, government-led initiatives promoting "smart classrooms" and AI-enhanced teaching have often prioritized well-resourced public schools as pilot sites, potentially providing their

teachers with earlier and more systematic exposure to AI tools. As a result, public school teachers' AI literacy and access to AI-related CPD may be more actively supported, whereas private school teachers may face greater barriers in engaging with AI integration. Such potential disparities sparked the initial interest in a comparative investigation between the two school types from teachers' perspectives and experiences.

The present study then seeks to bring together three areas that have typically been investigated in isolation: AI literacy, need-satisfaction school support, and motivation for AI-related CPD. Situated in the Chinese EFL context, it investigates to what extent teachers in public and private schools differ across those three areas, and explores the relationships among them. To achieve these aims, a mixed-methods approach, is used, combining an online questionnaire and follow-up semi-structured interviews to obtain a more comprehensive understanding.

## **2. Literature Review**

This chapter reviews the literature relevant to the present study. Section 2.2 explores key research on AI literacy, including the integration of AI in education, conceptual frameworks of AI literacy, and existing studies on teachers' AI literacy. Section 2.3 examines how teachers' perceived school support is related to their AI literacy and motivation, as well as how teachers' are motivated to participate in AI-related CPD, drawing on self-determination theory (SDT). Section 2.4 outlines the rationale and the research questions of this study.

### **2.1. AI Literacy**

#### **2.1.1. AI in Education**

Artificial Intelligence (AI) was first defined by John MacCarthy in 1956 as the science of making intelligent machines that can “use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves” (MacCarthy, 2007, cited in Russel & Norvig, 2010, p.17). Since then, AI has been defined in increasingly diverse ways, and a universally accepted definition has yet to be established (Wang, 2019).

For example, Baker and Smith (2019) defined AI as “computers which perform cognitive tasks, usually associated with human minds, particularly learning and problem-solving (p.10), while Goel and Davies (2019) proposed that AI includes three sub-fields, namely, “robotics, machine learning, and cognitive systems” (p.602). These definitions reflect the interdisciplinary characteristics of AI (Long & Magerko, 2020). In other words, rather than refer to a single, specific technology, AI encompasses a wide range of technologies such as machine learning, algorithms, and natural language processing (Zawacki-Richter et al., 2019).

With rapid advancements in these technologies, AI has become pervasive across industries, including finance, business or medicine (Lukin & Holmes, 2016), and plays an increasingly important role in many aspects of everyday life (Ng et al., 2021a; 2021b). Education is no exception. In fact, AI has begun to revolutionize the field, ushering in a new era of teaching and learning (Molefi et al., 2024; Su et al., 2023; Zhang & Zhang, 2024). For example, Lukin and Holmes (2016) described three kinds of educational software applications that help provide more personalized, inclusive, and engaging learning environments, including intelligent personal tutors, intelligent support for collaborative learning, and intelligent virtual reality to support learning in authentic environments. They also highlighted that to fully realize the transformative power of AI, teachers undoubtedly play a central role and should develop new and sophisticated knowledge and skills of AI application.

Later, Zawacki-Richter et al. (2019) conducted a systematic review of 146 publications on AI applications in higher education, identifying four main areas, including “profiling and prediction, intelligent tutoring systems, assessment and evaluation, and adaptive systems and personalisation” (p.20). Such AI applications have increasingly adopted and transformed language teaching (Koraishi, 2025). For instance, language learning platforms such as Duolingo use AI to adapt learning contents to learners’ levels of proficiency, and standardized testing organizations like ETS employ automated scoring systems to assess writing and even speaking performances and provide accurate feedback (Chen et al., 2021; ETS Global, 2024). These AI applications facilitate personalized and adaptive learning experience with improved efficiency.

While these AI applications hold significant potential to enhance teaching and learning practices, they also bring substantial challenges and risks. One of the most frequently

discussed concerns is the ethical use of AI in education (Özer, 2024; Zaman, 2024). For instance, AI tools have been increasingly used by students to complete assignments, projects, or essays. Excessive reliance on these tools, especially when used to generate entire pieces of work, can lead to unethical behaviors such as plagiarism and academic dishonesty. Currently, there still exists a lack of robust and reliable detection tools, making such practices often go unnoticed and potentially resulting in unfair grading (Chiu, 2023). Students who use AI extensively may receive higher marks than their peers who complete work independently, thereby undermining the fairness and integrity of educational assessment systems (Sok & Heng, 2023). Moreover, inequitable access and digital divides are exacerbated by disparities in digital and AI literacy across and within countries, disadvantaging under-resourced schools, teachers, and students (Özer, 2024). While many teachers are often found to be underprepared to integrate AI into teaching practice, lacking both sufficient AI literacy and relevant pedagogical skills (Su et al., 2023), teachers from disadvantaged educational environments may face even more fundamental barriers, lacking access to AI technologies and AI literacy. Additionally, the educational transformation driven by AI advancements is reshaping teachers' professional roles. As the capabilities of AI technologies continue to evolve, the role of teachers is increasingly being questioned, with ongoing debates over whether AI might replace human teachers (Selwyn, 2019).

In response to these challenges, many researchers argue that teachers in the era of AI need to acquire not only professional knowledge or skills but also but also competencies to use AI effectively, efficiently and appropriately (Ayanwale et al., 2024; Fenwick, 2018; Lacity & Willcocks, 2017; Xu, 2020; Zhai et al., 2021) . In this light, it would be reasonable to expect that increasing research attention has been devoted to understanding and enhancing teachers' AI literacy, which incorporates a range of competencies such as critically evaluating AI, communicating and collaborating with AI, and effectively using AI (Long & Magerko, 2020). However, this area remains largely under-explored within the field of teacher education (Konnke et al., 2025; Ng et al., 2023; Sperling et al., 2024; Wu & Miller, 2025). Some scholars further argue that AI users, including teachers, to a large extent have been AI illiterate, without sufficient AI-related knowledge or competencies (Pinski & Benlian, 2024; Wilton et al., 2022). These all highlight the need to investigate and understand teachers' AI literacy in specific educational contexts so as to improve it.

In China, the government has actively promoted AI integration into education in recent year, launching initiatives such as “smart classrooms”, “remote synchronous classroom”, and “smart campus”. These initiatives have often prioritized public schools, with large-scale pilot projects supported by substantial infrastructure investments as well as technical and professional development support. Private schools, however, due to differences in governance and funding models, may have limited access to such AI-related resources and training. Addressing this gap, the present study examines the AI literacy of teachers in Chinese public and private schools, aiming to provide a deeper understanding of their AI literacy, and to determine whether disparities in AI literacy exist between the two school types.

### **2.1.2. Conceptualization of AI Literacy**

As AI continues to reshape various sectors of society, including education, the concept of AI literacy has emerged as a growing area of global research interest (Sperling, 2024). Although still in its infancy, AI literacy has been described and defined in diverse ways, prompting many researchers to call for further conceptual refinements (Laupichler et al., 2022; Sperling, 2024).

AI literacy, widely recognized as a multidimensional construct (Pei et al., 2025), was initially defined by Kandlhofer et al.(2016) as the ability not only to use AI technologies or applications, but, more importantly, to understand the underlying techniques and concepts behind them. Since then, the concept has been further explored and redefined, resulting in various conceptualizations that differ in terms of the composition and configuration of relevant abilities and competencies.

Long and Magerko (2020) define AI literacy as “a set of competencies that enable individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace”(p. 2). They further distill a list of 17 specific competencies from a wide range of interdisciplinary literature, organized under five key themes including “What is AI; What can AI do?; How does AI work?; How should AI be used?; and How do people perceive AI?” (p. 3). This conceptualization offers a broad understanding of AI literacy that goes beyond technical and

conceptual knowledge, encompassing cognitive, social, and ethical dimensions, and thus is often frequently cited as a comprehensive definition of AI literacy.

Similarly, Kong et al. (2021) conceptualize AI literacy through three competence components: understanding AI concepts, as well as using those concepts to evaluate and understand the real world through problem solving. While this conceptualization broadly aligns with that of Long and Magerko (2020), it is less comprehensive and omits dimensions such as AI ethics, which is increasingly recognized as an integral part of AI literacy that requires greater attention (Dabbagh et al., 2025; Sperling et al., 2024; Wilton et al., 2022; Xu, 2020).

More recently, based on a review of 68 multidisciplinary studies, Pinski and Benlian (2024) propose a two-dimensional framework of AI literacy, in which five proficiency dimensions (knowledge, awareness, skills, competencies, and experience) are closely interrelated with six AI subject areas (AI models, data for AI, AI interfaces, AI tools, humans/organizations/society, cross area). They argue that the integration of these proficiency dimensions across subject areas enables “purposeful, efficient, and ethical” (p. 1) use of AI, thereby conceptualizing AI literacy as a “holistic proficiency concept” (p. 16) with “an enabling character” (p. 4). Additionally, they point out that different user groups (e.g., experts vs. non-experts, doctors vs. Teacher), require and demonstrate different AI literacy, highlighting the relevance of focusing the present study specifically on English teachers’ AI literacy in China.

While Long and Magerko (2020) and Pinski and Benlian (2024) have proposed theoretically inclusive and comprehensive conceptualizations of AI literacy, their definitions to some extent are less practical in empirical research, with the former containing a list of 17 competencies and the latter encompassing the holistic and complex interrelations between five proficiency dimensions and six subject areas. This study then adopts Ng et al.’s (2021a, 2021b) conceptualization, which comprises four dimensions that are more focused and manageable for empirical investigation of teachers’ AI literacy and directly relevant to educational contexts.

According to Ng et al. (2022), AI literacy, despite variations in its definitions, is generally conceptualized as a range of technological attitudes, skills, and competencies enabling effective and ethical use of AI in daily life. In earlier work, through systematic reviews of 18

and 30 peer-reviewed articles in the field of education respectively, Ng et al. (2021a, 2021b) identified four core dimensions of fostering AI literacy. These dimensions—knowing and understanding AI (KUAI), applying AI (AAI), evaluating and creating AI (ECAI), and AI ethics (AIE)—are mapped onto the cognitive domains of Bloom’s Taxonomy, extending from lower-order thinking skills such as remembering and understanding to higher-order skills including applying, analyzing, evaluating, and creating, and provide a structured framework for AI literacy.

In this framework, KUAI refers to knowing the foundational knowledge of AI concepts, skills, and how AI systems function; AAI involves the ability to apply AI knowledge, concepts, and applications in different contexts; ECAI encompasses higher-order thinking skills, including evaluating, communicating and collaborating with, designing AI applications; AIE focuses on human-centered considerations such as issues related to fairness, accountability, transparency, and ethics. While most of the reviewed studies foster AI literacy primarily by enhancing the dimensions of KUAI and AAI, the other two dimensions, ECAI and especially AIE, are relatively less discussed or emphasized as integral components of AI literacy. This imbalance highlights the importance of adopting a comprehensive framework, such as that proposed by Ng et al. (2021a, 2021b), which equally values all four dimensions, to fully understand components of teachers’ AI literacy and address the existing weaknesses to foster improvements.

### **2.1.3. Research on Teachers’ AI Literacy**

As highlighted by World Economic Forum (2022), “Building an AI-powered society that benefits all requires each of us to become literate about AI”, demonstrating the growing global awareness of the importance of AI literacy in all walks of life. While much attention has been paid to equipping students with AI literacy, teachers, who are expected to both adopt AI in their teaching and foster students’ AI literacy, are often overlooked (Pan & Wang, 2025). Compared with the rapidly expanding body of research on students’ AI literacy, studies focusing on teachers’ AI literacy remain relatively limited.

Among the existing studies, many report that teachers’ current levels of AI literacy are far from ideal, with gaps in different dimensions. For example, Li et al. (2023) and Yoon and

Jang (2024) examined the overall levels of AI literacy among 323 pre-service teachers in China and 105 in Korea, respectively. The former developed a Likert-scale questionnaire measuring AI knowledge, ability, awareness, and ethics, drawing on measurement frameworks for digital and information literacy. The latter adopted Hwang et al.'s (2024) scale, which assesses five dimensions of AI literacy: identification, understanding, usage, application, and creation. Analyzing quantitative data from self-reported surveys, both studies found that the overall levels of AI literacy were relatively low. Notably, while Li et al. identified teachers' particularly low competence in AI ethics, whereas Yoon and Jang did not include ethics as a dimension at all, showing that AI ethics may be overlooked not only by both pre-service teachers but also by some researchers. In addition, the instruments used by both studies were not well-developed based on comprehensive frameworks of AI literacy. Instead, they either based their research on conceptualizations of other forms of literacy or employed poorly constructed Likert scales, with some dimensions measured by as few as two items—a number generally insufficient to ensure acceptable internal consistency and reliability. Such limitations may potentially compromise their ability to capture the full picture of teachers' AI literacy—an issue that future research should address.

Similarly, Pei et al. (2025) examined 200 pre-service teachers' AI literacy in the US. However, unlike the two studies reviewed above, they used a well-designed questionnaire developed under the guidance of Bloom's Taxonomy and technology acceptance model 3, with four layers to measure participants' understanding of AI, perceptions of applying AI, AI ethical issues, and professional development. Drawing on both qualitative and thematic analysis, the study revealed teachers' limited awareness of AI ethics, an issue noted in many other studies (Ayanwale et al., 2024; Li et al., 2023; Selwyn, 2019; Sperling et al., 2024; Xu, 2020). In addition, they found that participants, although with relatively strong knowledge of AI concepts, showed weaker understanding of AI mechanisms, indicating a superficial understanding of AI. Such insufficient understanding appeared to further affect their confidence in AI knowledge, comfort in using AI, and confidence in future AI application. This finding echoes earlier research that highlights the critical role of understanding fundamental knowledge of AI in improving the willingness and confidence in the integration of AI technologies (Stolpe & Hallström, 2024; Zhao et al., 2022). Despite the robust research design, the relatively small sample size limited the power of this study, highlighting the need for future research with larger samples across diverse contexts.

Among larger participant groups (1013 Chinese middle school teachers and 529 Nigerian pre-service teachers, respectively), Zhao et al. (2022) and Ayanwale et al. (2024). not only examined teachers' overall levels and components of AI literacy but also explored the relationships among these dimensions. While the former grounded their research and Likert-scale questionnaire in Ng et al.'s (2021a, 2021b) four-dimensional framework of AI literacy, the latter developed their study and survey scale by integrating multiple frameworks, including those proposed by Long and Magerko (2020), Ng et al.(2021a, 2021b), and Caroulus et al. (2023). Despite their differing conceptualizations of AI literacy, both studies offered comprehensive investigation of the relationships among similar variables including Knowing and understanding of AI (KUAI), AI Ethics, Apply AI, Evaluate/Create AI, using structural equation modeling. Their findings highlighted the foundational role of knowing and understanding AI (KUAI) in positively influencing other dimensions.

In contrast to the subjective measurements of AI literacy used by studies above, Ding et al. (2024b) designed and validated their own instrument incorporating 25 objective-based items in the form of "multiple-choice questions, true/false statements, and sorting inquiries. They categorized the 17 competencies proposed by Long and Magerko (2020) into five facets, and constructed items to assess each facet from references cited by Long and Magerko's work and other existing academic materials, which were further discussed, reviewed, revised by an additional professor and the primary researcher. They administered the assessment among pre- and in-service teachers in the US and collected 196 responses. Descriptive results indicated that both types of teachers had moderate levels of AI literacy, with in-service teachers slightly outperforming pre-service teachers. They also revealed teachers' lack of solid or in-depth knowledge of the mechanisms of how AI works, aligned with Pei et al.'s (2025) findings. In addition, they used diverse approach to validate the assessment they developed, including expert review and statistical analyses such as exploratory factor analysis and item response theory, thereby confirming its the validity. However, as Lintner's (2024) systematic review of 16 AI literacy scales revealed, most scales for AI literacy still lacked certain forms of statistical validation (e.g. content/construct validity and responsiveness) and, more importantly, had not been tested across different cultural contexts. This suggests that Dint et al.'s (2024b) objective assessment, along with other self-reported instruments used in studies reviewed earlier, should be further examined for validity in varied educational and cultural settings.

While general teachers' AI literacy has been explored to some extent, studies specifically investigating language teachers' remain even more scarce (Koraishi, 2025; Liu, 2025; Pan & Wang, 2025). Although language teachers, especially English language teachers, have generally responded positively, showing enthusiasm for adopting AI tools to enhance teaching practices (Molefi et al., 2024), their levels of AI literacy haven't been the focus of most studies. Wang and Pan (2025) conducted a mixed-methods study, including a self-designed and validated online survey and semi-structure interviews, among 782 English teachers in Chinese universities to investigate teachers' AI literacy in the context of English as a foreign language (EFL). They found that most of English teachers had moderate, good or excellent AI literacy (45.5%, 28.4%, and 14.1% respectively), while only 12.1% of teachers self-reported to have poor AI literacy. The results appeared to be better than those reported in studies previously reviewed. Such a difference may be related to teachers' increasing exposure to AI in recent years, contextual differences or characteristics specific to this teacher group, underscoring the importance of investigating the current state of AI literacy among language teachers, English as a Foreign Language (EFL) teachers in particular for the present study, in diverse contexts.

Taken together, limited research on teachers' AI literacy depicts a picture of teachers who demonstrate unsatisfactory yet dynamic and developing overall levels of AI literacy. Results on components of teachers' AI literacy revealed their lack of awareness of AI ethics and variations in their other aspects. These make it important to conduct studies in different contexts on AI literacy of teachers, especially language teachers, in order to have a more comprehensive understanding of their AI literacy profiles and thus inform the design of relevant programs to foster improvements.

## **2.2. School Support and Teachers' Motivation for AI-Related Continuous Professional Development (CPD)**

### **2.2.1. AI-Related CPD and Its Effectiveness**

The conceptualizations of teacher Continuous Professional Development (CPD) have evolved over the years. Earlier definitions tended to equate CPD with training events held

occasionally to deliver cognitive knowledge or skills to maintain teachers' quality, competence, and accountability (Bolam, 1982; Kennedy, 2007; Sturrock & Lennie, 2009).

More recent perspectives emphasize life-long learning for both professional and personal development as well as the importance of teachers' individual needs and attitudes (Bolam & McMahon, 2004; Earley & Bubb, 2004; Hargreaves, 1995). The present study adopts a more comprehensive definition of CPD proposed by Day (1999, p4):

Professional development consists of all natural learning experiences and those conscious and planned activities which are intended to be of direct or indirect benefit to the individual, group or school, which contribute through these, to the quality of education in the classroom. It is the process by which, alone and with others, teachers review, renew and extend their commitment as change agents to the moral purposes of teaching; and by which they acquire and develop critically the knowledge, skills and emotional intelligence essential to good professional thinking, planning and practice with children, young people and colleagues throughout each phase of their teaching lives. (Day, 1999, p.4)

According to this definition, teachers' CPD encompasses a wide range of formal and informal learning experiences that contribute to their growth, development, and positive change. These activities are not limited to the acquisition of professional knowledge, skills, and competence necessary for delivering high-quality education; they also address the emotional and moral dimensions of teachers' personal and professional lives. Importantly, CPD is defined as a lifelong, reflective process that evolves across the different phases of a teacher's career, involving both individual and collaborative learning.

Building on this conceptualization, the present study defines AI-related CPD activities as any natural or planned learning opportunities—such as workshops, training sessions, self-directed exploration, or collaborative discussions—that aim to enhance any aspect of teachers' AI literacy in educational contexts. These activities may be school-supported or self-driven and reflect varying degrees of engagement, from raising basic awareness to facilitating pedagogical applications of AI.

As CPD has been widely recognized as a key factor in improving teacher quality and thus students' achievements across various contexts (Avalos, 2010; Lessing & De Witt, 2007; Saleem et al., 2021; Wan, 2011; ), numerous studies have been focused on how to design and deliver more effective CPD programs (Guskey, 2003). This has resulted in the identification of a series of characteristics of effective CPD, including a strong content focus, sustained

course duration, relevance to teaching practice and school goals, and opportunities for collaboration (Murray, 2014). In the context of AI-related CPD, the newly emerging area in teacher education, some initial efforts have been made to propose programs effective in supporting teachers' development in AI literacy.

Several recent studies have argued that specific types of AI-related CPD programs can be effective in enhancing teachers' AI literacy. For example, based on Ng et al.'s (2021a, 2021b) framework of AI literacy, Ding et al. (2024a) designed a four-hour AI-related CPD program consisting of a lecture, discussions of three video-recorded cases of AI pedagogical application, and online surveys, and investigated its influence on AI literacy among seven middle school science teachers in the US. It was found that the overall levels of teachers' self-reported AI literacy significantly increased after the program, with most gains in their understanding of AI concepts and their pedagogical application of AI. Similarly, Vazhayil et al. (2019) described a two-day workshop for 34 computer science teachers without any prior knowledge about AI concepts. Through self-paced learning of training materials and hands-on, game-based activities—such as developing chatbots and image recognition tools—teachers engaged in collaborative and reflective learning, which fostered a deeper understanding of AI. Qualitative data, including interviews and video reflections, revealed participants' highly positive attitudes towards the program design. In another study, Kandlhofer et al. (2019) attempted to design a standardized certification system for AI education, involving validated multiple-choice questions and interactive tasks to test learners' AI knowledge. The curriculum included five-day classes and 50 hours of online learning, in which teachers are trained to be certified trainers who then delivered the training to certify students as certified trainees.

While these studies developed and to some extent confirmed the effectiveness of some forms of AI-related CPD programs, they are mostly small in scale, often involving limited numbers of participants within specific institutional or regional contexts. Furthermore, there is no control group or comparison condition to determine the relative effectiveness of the programs, and no follow-up assessments were conducted to evaluate their long-term effectiveness. Additionally, the CPD activities examined are often stand-alone or short-term interventions, rather than part of a coherent, sustained, and systematically designed pathway for CPD. Moreover, these programs often lack a clear theoretical or scientific framework to inform curriculum design, making it difficult to determine what content should be included

or prioritized to develop comprehensive AI literacy. These limitations make it difficult to draw firm conclusions about the effectiveness of such AI-related CPD programs, pointing to the need for further validation across diverse educational settings and larger teacher populations. However, these early efforts represent important first steps in addressing the gap in AI-related teacher education. They highlight the potential and value of AI-related CPD programs to support teachers' AI literacy.

However, regardless of how well these programs are designed and delivered, they cannot reach their full potential if teachers are not willing or motivated to participate. Increasingly, scholars argue that it is not merely the effectiveness of CPD design, but rather teachers' motivation to participate that plays a decisive role in determining the impact of CPD activities (Liu et al., 2014; McMillan et al., 2016; Osman & Warner, 2020). In the context of teachers' AI literacy, therefore, it is essential to investigate what motivates them to participate in AI-related CPD activities to ensure meaningful and effective CPD.

### **2.2.2. School Support and Motivation: A Self-Determination Theory (SDT) Perspective**

Motivation, as a complex and multifaceted concept (Dörnyei, 2001), has been extensively researched, resulting in a variety of conceptualizations and theoretical frameworks ranging from Maslow's (1954) hierarchy of needs and Herzberg et al.'s (1959) two-factor theory to Deci and Ryan's (1985) Self-Determination Theory (SDT). The present study adopts SDT, a classical and influential theory widely used to interpret studies on teachers' motivation (Lam et al., 2010; Yang, 2021).

According to SDT, motivation is categorized into amotivation, extrinsic motivation, and intrinsic motivation. Amotivation refers to "the lack of any forms of regulation, whether extrinsic or intrinsic" (Dörnyei & Ushioda, 2011:27). Extrinsic motivation refers to engaging in activities for external rewards or incentives, whereas intrinsic motivation refers to doing activities for their inherent interest, enjoyment or curiosity.

Despite the seemingly opposing nature of extrinsic and intrinsic motivation, Ryan and Deci (2000) argue that these constructs lie along a continuum rather than forming a dichotomy, reflecting different degrees of autonomy or self-determination. The continuum places participating in activities out of heteronomy (e.g. external obligation) and autonomy (internal desires) at each end. While intrinsic motivation is autonomous and self-determined, extrinsic

motivation is not necessarily heteronomous. When individuals internalize the external obligation, their extrinsically-motivated behaviors can become more autonomous. According to SDT, the greater the degree of internalization, the more self-determined the individual's regulation is likely to be. In this light, extrinsic motivation is further divided into four sub-types, namely: external regulation, introjected regulation, identified regulation, and integrated regulation, varying in the degrees of internalization and self-determination. External regulation is the least internalized, with actions controlled by external incentives; introjected regulation involves partial internalization, with individuals engaging in activities to avoid anxiety or improve self-esteem; identified regulation involves relatively higher levels of self-determination as individuals perform an action because of their recognition and acceptance of its value; integrated regulation is highly self-determined and autonomous, with individual engaging in an activity due to its importance to their sense of self. While individuals can be simultaneously motivated by multiple types of motivation, and different types of motivation are all important, it has been widely supported in literature that intrinsic motivation and autonomous or well-internalized forms of extrinsic motivation can predict better achievements in different educational contexts (Froiland & Worrell, 2016; Hein et al., 2012; Ryan & Deci, 2020; Taylor et al., 2014).

SDT argues that while individuals have innate or autonomous motivational tendencies to seek psychological growth, learning, mastery and connection, these propensities are not automatic. In fact, they entail supportive conditions from the environment to be robust. According to SDT, individuals are driven by three basic psychological needs for autonomy, competence, and relatedness. The need for autonomy refers to the need to feel that one's actions are self-initiated and self-regulated, rather than externally controlled; the need for competence involves the need to feel capable and experience mastery of tasks or skills; and the need for relatedness is the need for belonging and connection with others (Wut et al., 2025; Ryan & Deci, 2020). These needs play a critical role in individuals' healthy development and should be supported and satisfied. When the environment is supportive enough to meet all these needs, higher levels of motivation for engaging in activities can be fostered (Chui et al., 2024; Lam et al., 2010; Ryan & Deci, 2020). Furthermore, Ryan and Deci (2020) argue that supports for basic psychological needs can enhance intrinsic motivation and the internalization of extrinsic motivation. In other words, when these basic needs are satisfied, individuals can feel their behaviors are internally initiated and self-

determined, resulting in enhanced intrinsic motivation and internalized extrinsic motivation, and thus achieving better well-being and development (Yang. 2021).

Based on SDT, schools, as the environments that can facilitate or hinder motivation, play a critical role in shaping teachers' motivation. To be specific, when schools provide sufficient support to satisfy teachers' needs for autonomy, competence, and relatedness, teachers are more likely to have enhanced intrinsic motivation or more internalized forms of extrinsic motivation. However, in practice, many teachers are forced to support students' psychological needs without theirs being well supported, often facing various institutional constraints (Ryan & Deci, 2020). This imbalance is evident in the context of AI literacy education, where teachers are encouraged and expected to integrate and even teach AI, yet may lack institutional support to meet their needs for the development of AI literacy. Addressing this gap, the present study investigates the extent to which teachers' basic psychological needs are supported within school environments, and how such school supports relate to their motivation to engage in activities to enhance AI literacy.

### **2.2.3. Research on School Support and AI Literacy**

Although school support has been investigated in a range of studies for its role in promoting students' AI literacy (Lee et al., 2020; Shen & Cui, 2024; Xia et al., 2023) , limited research has explored how schools support teachers' three psychological needs for autonomy, competence, and relatedness in the context of AI literacy development.

Some studies have found that their access to relevant institutional support remains limited, further hindering teachers' successful integration of AI in education. For example, Kohnke et al. (2025) conducted a qualitative study with 15 pre-service teachers studying in a teacher education program in Hong Kong to explore their perceptions of AI integration and AI literacy development. Thematic analysis of semi-structured interviews revealed that, although participants consistently acknowledged the importance of developing AI literacy and expressed a strong need for institutional guidance, the institutional support they received varied considerably. While some reported access to occasional workshops, lectures, or short courses aimed at building AI-related skills, others stated that their university provided no relevant support at all. Participants also emphasized that AI-related training should not be

one-off or isolated; rather, schools should encourage ongoing and sustained professional development to ensure meaningful and long-term growth in teachers' AI literacy. Additionally, Su et al. (2023) and Laupichler et al. (2022) reviewed literature on AI literacy in early, higher and adult education contexts. Both reviews identified a widespread lack of AI knowledge, skills, and confidence in AI integration among teachers. Teachers were also found to lack the competence to design AI courses or determine appropriate content, and they did not have access to school-level guidelines or institutional direction. These findings collectively demonstrated that schools failed to provide adequate support to meet teachers' needs for competence in AI literacy.

While these studies collectively highlight the lack of institutional support for teachers' AI literacy development, they tend to adopt largely descriptive approaches, focusing on general perceptions of school support or teachers' performances in teaching AI-related content. In the absence of guiding theoretical frameworks for school support, such as need-supportive theory in SDT, these studies offer limited insight into the underlying mechanisms. Specifically, they do not examine what kinds of support teachers receive or lack, nor how different forms of school support relate to their motivation to engage in AI-related CPD activities and their AI literacy levels.

Addressing this gap, some studies have explored how school environments that align with teachers' basic psychological needs can enhance their AI-related knowledge, motivation, and classroom integration (Chiu et al., 2024; Shen & Cui, 2024; Wu & Miller, 2025; Wut et al., 2025). For example, drawing on Falloon's (2020) framework of teacher digital competence (TDC), which includes personal-professional and personal-ethical competences, Chiu et al. (2024) employed a mixed-methods approach to investigate how school environments support teachers' psychological needs, contribute to their competences in using digital technologies including AI-related technologies and influence their engagement in TDC development activities. The researchers collected quantitative data from 370 in-service secondary school teachers through a structured questionnaire, measuring perceived school learning support, need satisfaction (autonomy, competence, relatedness), and digital competence. In addition, they conducted qualitative focus group interviews and school document analysis to have in-depth understanding of how teachers' TDC can be fostered by need-supportive strategies. The findings revealed that school support positively predicted TDC, and this relationship was fully mediated by the satisfaction of teachers' basic

psychological needs for autonomy, competence, and relatedness (belonging, connection, collegial support). The study also proposed 12 need-supportive strategies to be embedded in professional development systems to satisfy teachers' three needs, and thus foster strong TDC and motivation to engage in TDC professional development. This well-designed study provide valuable insights into the relationships perceived school support and TDC including AI-related skills. However, it does not isolate AI literacy as a distinct domain, overlooking the specific demands and distinct nature of AI literacy.

To address this gap, Wut et al. (2025) conducted a quantitative study in the higher education context to investigate how perceived institutional support and perceived risk of AI relate to teachers' AI literacy. Based on survey data from 123 university teachers, the results showed that perceived autonomy and competence support were positively associated with AI literacy, consistent with the relevant findings of Chiu et al. (2024). However, perceived relatedness support (feeling cared/close/connected with others) was not found to have a significant effect on AI literacy, diverging from Chiu et al.'s study, where perceived relatedness support also predicted digital competence. This divergence may be attributed to contextual differences between two studies. While Chiu et al. (2024) focused on secondary school teachers, who may experience more collegial collaboration and peer learning, Wut et al.'s (2025) participants were university faculty, who tend to work more independently. These findings suggest that the role of relatedness support in AI literacy development may vary across educational settings, highlighting the need to examine how different forms of institutional support function in diverse teaching contexts.

#### **2.2.4. Research on Teachers' Motivation for AI-related CPD**

While AI literacy has emerged as a globally significant research area, it remains largely underexplored within the context of teacher education, particularly in relation to teachers' own AI literacy development and their motivation to engage in relevant CPD activities. This can be seen from Sperling et al.'s (2024) review of 34 peer-reviewed articles on AI literacy and teacher education published over the past 23 years. Their analysis identified six major research themes: curriculum development, AI literacy frameworks, teachers' attitudes and (mis)conceptions, teaching with and about AI, professional development, and AI ethics. Among these, studies on professional development primarily focused on strategies to

enhance teachers' AI literacy through CPD initiatives. However, teachers' motivation to participate in such CPD programs has received little direct attention across the papers reviewed in their study.

The few studies that have focused on this area tend to lack methodological rigor and theoretical grounding. For example, Indrayani et al. (2024) conducted a survey among 502 Indonesian teachers to investigate how teachers' awareness, perception, and learning motivation influence classroom learning evaluation. Although the study included fifteen items intended to measure teachers' motivation to learn about AI, no explanation was provided regarding how these items were developed or theoretically grounded. While the authors stated that the instrument's validity and reliability were assessed using SPSS 21, the specific procedures and statistical outcomes were not reported. Moreover, the results related to learning motivation were not presented in detail, leaving teachers' motivational profiles unclear. Similarly, Tang et al. (2025) examined the motivation for AI literacy education among older adults rather than focusing on teachers. Although this study reported a high average level of motivation based on overall mean scores, it did not investigate how various factors contributed to participants' motivation, leaving the underlying drivers largely unexplored. Overall, these two studies reviewed represent valuable initial attempts to address teachers' motivation in the context of AI-related CPD; however, their research design and presentation of results could have been more systematically structured and methodologically rigorous, indicating a significant gap that calls for more robust investigations in this area.

While research specifically focusing on teachers' motivation to engage in AI-related CPD remains scarce, a number of studies have investigated teachers' motivation for general or specific CPD programs. These studies have examined a range of motivational factors influencing teachers' participation in CPD, and explored the role of motivation in CPD engagement and outcomes, using diverse methodological approaches and situated in varied contexts (Calleja, 2018; Gorozidis and Papaioannou, 2014; Jamaliade & Fatehi Rad, 2022; McMillan et al., 2016; Wal et al, 2014; Yang, 2021; Zhang et al., 2021).

Some of this research has examined teachers' motivational profiles for general or specific CPD, using qualitative and mixed-methods approaches with small samples across different contexts. For instance, Calleja (2018) investigated seven Maltese secondary school mathematics teachers' motivation to participate in a specific CPD program involving

workshops and follow-up peer support sessions. Using interviews, observations, and reflective journals, the study revealed that teachers were largely intrinsically motivated, driven by their desire to develop pedagogical understanding and improve classroom teaching. Similarly, MaMillan et al. (2016) used two focus groups (n=9) and a follow-up questionnaire (n=74) to investigate the CPD motivation of Irish teachers pursuing a master's degree, based on Herzberg et al.'s (1959) two-factor theory, which classified motivational factors into motivators (e.g. achievement, work itself) and hygiene factors (e.g. contextual factors such as pay, working conditions that prevent dissatisfaction but not directly motivate). The study found that teachers were highly motivated to engage in CPD, with intrinsic factors including personal growth and achievement being the primary motivators. Extrinsic factors, including interpersonal relations, school policy, and compulsory CPD, also played a role and should be promoted to motivate teachers to engage in CPD. Zhang et al. (2021) extended the scope with a larger quantitative sample of 472 secondary school teachers in China, examining how personal and school-level factors can influence teachers' CPD motivation for a specific CPD program. They found that personal factors such as successful prior experience, self-efficacy and teachers' perceptions about learning, and the school-level factor of principal leadership positively influenced teachers' autonomous motivation, while school-level factor of emotional pressure was negatively related to autonomous motivation.

More directly relevant to the English language teaching context, Yang (2021) and Jamaliade and Fatehi Rad (2022) explored EFL teachers' CPD motivation. Yang's (2021) large-scale mixed-methods study surveyed 402 Chinese university English teachers and conducted follow-up interviews to explore teachers' motivational profiles. Grounded in SDT, findings showed a strong identified and intrinsic motivation among teachers, indicating that teachers' participated in CPD activities primarily out of inherent interest or internalized goals rather than external incentives. In another study, Jamaliade and Fatehi Rad (2022) examined 42 EFL teachers in Iran, identifying 18 personal, school-level, and systemic factors affecting motivation. They acknowledged that while intrinsic motivation played a critical role in shaping teachers' engagement in CPD, extrinsic motivation also contributed meaningfully, suggesting that both forms of motivation interact in influencing teachers' participation. They also investigated the influence of personal factors including age, gender, and working experience on teachers' motivation, but found no significant differences. However, the small sample size limited the generalizability of the findings.

While these studies have explored the constituents of teachers' CPD motivation, some studies have further explored and supported the crucial role of motivation in CPD engagement. For example, Wal et al. (2014) conducted a large-scale survey involving 2360 secondary school teachers to examine motivational dimensions based on SDT, as well as their relationships to teachers' engagement in professional development and the satisfaction of teachers' basic psychological needs for autonomy, competence, and relatedness. Their findings indicated that teachers with more autonomous motivation including identified regulation (recognition of the value) and intrinsic motivation (e.g. achievement, interest) engaged more in professional development activities. Moreover, teachers' motivational profiles were found to be predicted by autonomy satisfaction (feeling self-regulated) and relatedness satisfaction (feeling connected). Likewise, among a relative smaller sample of 218 teachers, Gorozidis and Papioannou.(2014) investigated teachers' motivation to engage in the training and teaching of an innovative research project. Combining quantitative survey items with open-ended questions and written interviews, they aimed to gain a more comprehensive understanding of teachers' perceptions. Results showed that teachers with autonomous motivation positively related to teachers' intention to participate in such training and implement innovation.

Overall, while little research has examined teachers' motivation for AI-related CPD, particularly within EFL contexts, these studies on motivation for general CPD or specific CPD programs nonetheless offer valuable insights into this emerging area. Addressing this gap, the present study is situated in the Chinese EFL context, and aims to gain a more comprehensive understanding of teachers' motivational profiles for AI-related CPD activities.

### **2.3. Research Questions**

The literature review indicates that, despite growing global interest in AI integration in education, research on teachers' AI literacy, particularly within EFL contexts, remains scarce. Existing studies underscore the importance of teacher AI competence for effective classroom implementation and student learning; however, empirical evidence suggests that many teachers still lack sufficient AI knowledge and pedagogical skills. This highlights the need to examine both the overall levels and specific components of teachers' AI literacy to inform

strategies for its enhancement. Given that need-satisfaction school support plays a critical role in fostering teachers' motivation and AI literacy development, it is also necessary to explore teachers' access to such support. Furthermore, while CPD is widely recognised as a key mechanism for improving teachers' competence, evidence on effective AI-related CPD and on teachers' motivation to participate in such activities remains limited, highlighting the need to conduct investigations in these areas.

Additionally, as a Chinese EFL teacher, the researcher is aware that the advent of smart educational AI technologies and products, such as chatbots, English learning applications, or smart translation devices, may significantly challenge the teaching of English and the role of English teachers in China. This makes it important to understand English teachers' levels of AI literacy, the school support they receive, and their motivation to participate in AI-related CPD activities, in order to shed light on strategies to enhance AI literacy.

Addressing these gaps, the present study then examines the overall levels and components of teachers' AI literacy, the school support they perceive, and their motivation for AI-related CPD activities, particularly in the Chinese EFL context. Given Chinese public and private schools differ significantly in a range of aspects, as evidenced in both policy documents and personal observations, , which have the potential to shape teachers' AI literacy and CPD, the study also compares teachers across school types to provide a more nuanced understanding of how institutional contexts influence teachers' AI literacy development and their motivation to engage in AI-related CPD. The research questions are as follows:

1. To what extent does public school teachers' level of AI literacy differ from that of private school teachers?
  2. To what extent do public and private school EFL teachers differ regarding the school support for AI-related CPD activities they receive?
  3. To what extent does EFL teachers' motivation for AI-related CPD activities differ between public and private schools?
- 1) How are public and private school EFL teachers motivated to participate in AI-related CPD activities?

2) What factors impede EFL teachers to pursue AI-related CPD activities in public and private schools?

4. What are the interrelationships among teachers' AI literacy, perceived school support, and their motivation to engage in AI-related CPD activities?

1) What is the relationship between school support and AI literacy?

2) How does perceived school support relate to teachers' motivation towards AI-related CPD?

3) How does teachers' motivation towards AI-related CPD relate to AI literacy?

### **3. Methodology**

This chapter outlines the methodology employed in this study. A mixed-methods approach was adopted, combining an online questionnaire and follow-up semi-structured interviews, to collect both quantitative and qualitative data regarding Chinese EFL teachers' AI literacy, the school support they receive for enhancing AI literacy, and their motivation for participating in AI-related CPD activities. How the questionnaire and interviews were devised and conducted among targeted participants, as well as how the data collected were analyzed, will be further explained in this chapter.

#### **3.1. Research Design**

Mixed-methods approaches can help achieve a more comprehensive understanding of targeted phenomena or research questions, measuring overlapping, different, and complementary perspectives of these phenomena or questions (Dörnyei, 2007; Greene & Caracelli, 2003). Therefore, this study used a mixed-methods approach, combining an online questionnaire and follow-up online interviews. The questionnaire with close-ended questions was used to reach a greater number and range of respondents effectively. Since questionnaires can result in surface-level understanding of the areas explored (Dörnyei, 2007), semi-structured interviews were conducted to focus the discussions on key topics identified in the questionnaire and at the same time explore new relevant themes.

To recruit participants for the questionnaire, non-probability sampling, such as convenience sampling and snowball sampling, was employed, in which participants are selected based on accessibility or identification by others rather than through random selection. After completing the collection of quantitative data through the questionnaire, participants who volunteered for follow-up interviews were selected. To minimize the researcher's biased selection while ensuring a balanced number of participants representing each school type and city, stratified random sampling was used. From the pool of individuals who had agreed to participate in both parts of the study, a random sample was drawn within each school type and city. Once the interviewees were selected, they were contacted to arrange for interviews on Microsoft Teams.

### **3.2. Participants**

The target participants of this study were Chinese EFL teachers in both public and private secondary schools. When deciding where the research should be conducted, accessibility of teacher participants was among the main concerns. Given the researcher had been working in Beijing, the capital city of China, for many years and thus had some resources to reach teachers in several schools, Beijing was the first target city for the research. Since Shanghai (a global financial hub), Guangzhou (a major trade and manufacturing city), and Shenzhen (a leading tech city), together with Beijing, are widely recognized as China's four "super tier-1" mega-cities with comparable levels of economic development and global influence, this study focuses on secondary school in these four cities, where teachers may be more likely to access, learn about, and adopt newly emerging technologies such as AI.

A total number of 133 teachers from approximately 55 schools participated in the questionnaire between 25<sup>th</sup> May and 15<sup>th</sup> June 2025. Among them, 68 teachers were from public schools and 65 from private schools. In terms of school location, the sample included 28 teachers each from Beijing and Shanghai, 53 from Guangzhou, and 24 from Shenzhen. Detailed demographic information is provided in the Appendix 1.

43 teachers volunteered for follow-up interviews, and nine of them were interviewed. Among them, three teachers were from Beijing (one from a public and two from private

schools), while each of the other three cities was represented by two teachers (one public and one private). The only male participant was from a public school in Guanzhou.

### **3.3. Instruments**

#### **3.3.1. Questionnaire**

The questionnaire (Appendix 2) used in the present study was first drafted in English, and then translated into a participant-friendly Chinese version. One round of initial piloting was conducted for the English version and one for the Chinese version, each involving four of the researcher's Oxford classmates or former colleagues (see Section 3.5.1 for details), to improve the clarity and accessibility (Dörnyei, 2007). The final Chinese questionnaire comprised seven sections and took approximately ten minutes to complete.

The first section of the questionnaire provided detailed information of participation and asked for participants' consent, followed by a section to collect their contact emails and willingness to participate in follow-up interviews and receive research results. Section 3, 4, 5 incorporated three scales previously used in other studies. In those studies, all three scales demonstrated high internal consistency, with Cronbach's alpha coefficients exceeding 0.9, well above the commonly accepted threshold of 0.7. The present study also did further post-hoc validation (see 3.7.1).

Section 3 measured teachers' levels of AI literacy using a 5-point Likert-scale questionnaire adopted from Zhao et al. (2022), which was originally developed to examine AI literacy of 1013 Chinese primary and middle school teachers, a research focus similar to that of the present study.

Section 4 and 5 included two 6-point Likert-scale questionnaires that were primarily adapted from those used in Lam et al. (2010). Those scales were originally developed to explore the school support teachers received to meet their needs for competence, autonomy, and relatedness, as well as their motivation to implement project-based learning under self-determined theory (Ryan & Deci, 2000). They were then revised and adapted to suit the context of participating in AI-related CPD activities. Since amotivation, an important motivation type at one end of the continuum of self-regulation, was not measured in Lam et

al.'s (2010) scales, items measuring amotivation were adapted from Yang's (2021) scale investigating Chinese TEFL teachers' motivation for CPD. Overall, Section 4 contained 15 items, with five items each measuring competence, autonomy, and collegial (relatedness) support; Section 5 included 23 items in total: three measuring amotivation, and five items each for external, introjected, identified, and intrinsic motivation.

Section 6 consisted of ten questions that were newly developed for the current study to explore teachers' perceptions about the challenges they met in participating AI-related CPD activities, differences between public and private schools, and responsibilities of stakeholders. The first nine were closed-ended questions in the form of multiple-choice/response and ranking questions, while the last one was an open-ended question designed to collect teachers' suggestions on how to enhance teachers' AI literacy and motivation to participate in AI-related CPD activities.

Demographic information was collected in the last section, following Dörnyei's (2007) recommendation that personal questions be placed at the end of the questionnaire to avoid potential negative influence of providing private information on respondents' answers.

### **3.3.2. Semi-Structured Interview**

The interviews were semi-structured and conducted in Chinese, with 15 pre-prepared questions to investigate teachers' perceptions about their AI literacy, school support they received, and their motivation for AI-related CPD activities. An interview guide was (Appendix 3) was drafted, revised after pre-piloting with two colleagues, and finalized for data collection. In the interviews, participants were asked the same set of questions, and the questions were open-ended, allowing participants to elaborate on the topics. Each interview lasted about 30 minutes. Throughout the interviews, the researcher always encouraged the participants to further explain any important issues they had newly brought up, thus resulting in richer qualitative data.

### **3.4. Procedure**

#### **3.4.1. Pilot**

Since piloting is significant and necessary to design effective instruments (Cohen, 2007; Dörnyei, 2007), the instruments used in this study including the questionnaire and interviews were piloted many times.

The questionnaire was drafted and developed in English in the beginning, and four of the researcher's Oxford classmates who had good English proficiency and the researcher's supervisor were invited to participate in the piloting and give their feedback. Several revisions were made. For example, instead of collecting participants' emails and willingness to participate in follow-up interviews at the end of the questionnaire, this part was moved to the second section to ensure better response rates. Additionally, the demographic information was moved to the end of the questionnaire, and the wording of some items were modified to simplify the language or avoid ambiguity. The questionnaire was then translated into Chinese by the researcher, and four of the researcher's former colleagues, teachers of subjects other than English, were invited to complete the Chinese version to identify any unnatural or ambiguous expressions, as well as the layout of the online Chinese questionnaire. After the final revision, the questionnaire was launched online on 25<sup>th</sup> May.

Although piloting seems less important in qualitative studies compared with quantitative ones (Dörnyei, 2007), the interview questions in this study were piloted with two former colleagues who also participated in piloting the questionnaire to enhance the wording and clarity of the questions. One of them also participated in a mock interview to prepare the researcher for the actual interviews.

#### **3.4.2. Questionnaire**

Because conducting research online can minimize time and space constraints, the questionnaire was administered online via Microsoft Forms. Snowball sampling and convenience sampling were used to recruit participants, whereby participants are selected based on accessibility or identification by others rather than through random selection. The link and poster of the questionnaire were sent to the researcher's personal contacts in certain

schools, who then helped disseminate the questionnaire link and invited colleagues meeting the inclusion criteria. Additionally, Chinese social media platforms, including 微信(WeChat), 小红书 (Little RedNotebook), were also used to post advertisements for the research. Potential participants who responded to the advertisement, were provided with the questionnaire link and an electronic poster, and were encouraged to invite other eligible participants. In this way, a greater number and range of participants were recruited.

### **3.4.3. Interview**

Following Dörnyeiš (2007) suggestion that 6-10 qualitative interviews are typically manageable for a single postgraduate student researcher, eight participants were initially targeted for the interviews. As the research was conducted in four tier-1 mega-cities in China and aimed to compare public and private schools, two English teachers, one from each school type, were randomly selected within each city. Participants were then provided with the information sheet and the consent form via Microsoft Forms and gave their informed consent electronically by checking relevant boxes and entering their names before the interview was arranged. Each interview lasted for 30 minutes, and was conducted on Microsoft Teams within two weeks of the questionnaire.

However, when contacted, one of the selected participants declined to participate. Consequently, another participant from the same school type and city was randomly selected and invited. After completing the interview with this replacement participant, the originally selected participant reconsidered and expressed her willingness to take part. Given that her inclusion would not disrupt the sampling balance much and could provide additional valuable insights, she was also interviewed. As a result,

### **3.5. Ethics**

This research received ethics approval (Appendix 4) in April 2025 from the University of Oxford Central University Research Ethics Committee (CUREC). The relevant details of informed consent have been given above. Information sheets and consent forms for the questionnaire and the interview are provided in Appendix 5 and Appendix 6, respectively.

### 3.6. Data Analysis

#### 3.6.1. Quantitative Data

Quantitative data collected through the online questionnaire was analyzed using R. Before analysis, textual responses were converted into numerical values according to a predefined coding scheme (Appendix 7). For example, Likert-scale responses (e.g., “强烈同意” for “strongly agree”) were assigned values from 1 (“strongly disagree”) to 5 (“strongly agree”), and single-choice questions (e.g. school type) were coded using categorical values (e.g., public school = 1, private school = 2). Multiple-choice questions were coded dichotomously, with “1” indicating that the option was selected and a “0” indicating that the option was not selected. For ranking questions, each ranked item was assigned a numerical value corresponding to its position, with “1” representing the highest rank and larger numbers indicating lower ranks.

#### Consistency and Reliability Checks

Furthermore, Cronbach’s alpha was computed to assess the internal consistency and reliability of the three Likert-scale questionnaires used to investigate AI literacy, school support, and motivation for CPD activities in the present study. Although these instruments had been validated in prior studies (Lam et al., 2010; Yang, 2021; Zhao et al., 2022), with high Cronbach’s alpha values indicating strong internal consistency, re-validation was still important as the scales were applied in a new context—Chinese EFL teachers—and two of them were revised and adapted to align with the research focus. For each scale, Cronbach’s alpha was computed both for the overall scale and for each subscale measuring a specific aspect or dimension. Results showed that the scales of AI literacy ( $\alpha = .91$ ), school support ( $\alpha = .948$ ), and motivation ( $\alpha = .822$ ) demonstrated acceptable to excellent reliability, and most subscales also showed satisfactory internal consistency ( $\alpha > .70$ ). However, the Knowing and Understanding (KUAI) subscale of the AI literacy scale yielded a relatively low alpha value ( $\alpha = .623$ ). A post-hoc analysis revealed that removing the second item of the KUAI subscale would slightly increase alpha to .65, which still falls below the

conventional threshold of .70. While values below .70 are generally viewed with caution, some scholars argue that alpha values between .60 and .70 can be acceptable, especially in social and exploratory research or newly developed scales (Hair et al., 2019; Taber, 2018). Therefore, the item was retained to preserve the theoretical structure and content validity of the construct. Full reliability statistics are presented in Appendix 8.

## Normality Checks and Analysis Methods

Prior to selecting appropriate statistical tests to answer the research questions, the normality of the Likert-scale data was examined. The Shapiro-Wilk test was first conducted for each variable within the two school groups. Results showed that only one variable had a p-value greater than .05, indicating that the vast majority of the data significantly deviated from a normal distribution. Given the sensitivity of the Shapiro-Wilk test to sample size, additional checks were performed using skewness and kurtosis statistics and visual inspection of histograms and Q-Q plots. These further supported the non-normality of the data: in 14 out of the 17 comparison sets, at least one group had skewness and/or kurtosis values falling outside the commonly accepted range of -1 to +1, and the graphical patterns also suggested non-normality. Based on these findings, the non-parametric Wilcoxon rank-sum test (Mann-Whitney U test) was employed to compare differences between public and private school teachers across all variables. Detailed normality tests are presented in Appendix 9.

Similarly, normality was tested for each of the variables of AI literacy, school support, and motivation for CPD, as well as their selected dimensions, to be used in the correlational analyses. Shapiro-Wilk tests indicated that none of the variables met the assumption of normality (all p-values < .05). Further examination of skewness and kurtosis values, along with visual inspection of histograms and Q-Q plots, confirmed the non-normal distribution of the data. Specifically, 20 out of 23 variable pairs had at least one variable with skewness and/or kurtosis values falling outside the commonly accepted range of -1 to +1. Given this pattern of non-normality, Spearman's rank-order correlation was employed to examine the associations between the constructs. Appendix 10 presents the results for normality tests.

In addition to data from Likert-scale questions, the questionnaire collected data from nine supplementary items in the form of multiple-choice, single-choice, and ranking questions,

capturing participants' views on impeding factors, perceived differences between public and private schools, and responsibilities of stakeholders. Given the categorical and ordinal nature of the data, descriptive statistics were first used to summarize participants' responses. For single-choice questions, Chi-square tests examined whether the two groups differed significantly in their choice distributions. For multiple-choice and ranking questions, Spearman's rank-order correlations assessed the association between the groups' overall response patterns.

### **3.6.2. Qualitative Data**

Automatically-generated interview transcriptions were downloaded from Microsoft Teams, and then checked for accuracy before anonymization. Those Chinese transcriptions were analyzed thematically, following a deductive, top-down approach (Braun & Clarke, 2006) and guided by the research questions and predefined key areas reflected in the questionnaire and interview guide. For example, the key area of school support was organized into three categories, which served as the initial framework for coding. Relevant data were identified, allocated to relevant categories, and further organized into subcategories. Representative quotations were selected and translated into English for illustration in the result section.

By contrast, responses to the open-ended question in the questionnaire were analyzed using an inductive, bottom-up approach. Initial codes were generated after multiple readings of the responses. They were then organized into potential themes.

The codebooks for each analysis are presented in Appendix 11 and Appendix 12.

## **4. Quantitative Results**

This chapter presents the quantitative results of the online questionnaire, followed by the qualitative results discussed in the next chapter. The results are organized into four sections, each addressing one of the research questions.

#### 4.1. Differences in AI Literacy

This section addresses the first research question, which investigates to what extent public and private school teachers differ in their levels of AI literacy. Based on Ng et al.'s (2021a, 2021b) framework and Yang's (2022) study, the present study examines four dimensions of AI literacy: Knowing and Understanding AI (KUAI), Applying AI (AAI), Evaluating AI Application (EAI), and AI Ethics (AIE). The overall AI literacy score for each participant was computed based on their average across these four components. Wilcoxon rank-sum test was conducted to see if the scores from public and private schools differed on this measure.

Table 4.1 Comparison of overall AI literacy across school types (Wilcoxon rank-sum test)

|                           | Public School |      |        | Private School |      |        |                 |               |              |
|---------------------------|---------------|------|--------|----------------|------|--------|-----------------|---------------|--------------|
| Variable                  | Mean          | SD   | Median | Mean           | SD   | Median | W_<br>statistic | p_value       | Effect_<br>r |
| Overall<br>AI<br>literacy | 4.02          | 0.65 | 4.23   | 3.94           | 0.41 | 4.05   | 1726            | <b>0.029*</b> | 0.189        |

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

As shown in Table 4.1, although the scores for both public and private school teachers indicated relatively high levels of AI literacy, with median and mean scores around 4 on a 5-point scale, the scores for private school teachers ( $M=4.02$ ,  $Mdn=4.23$ ) were higher than for public school teachers ( $M=3.94$ ,  $Mdn=4.05$ ), and the Wilcoxon rank-sum test indicated that this difference was statistically significant ( $W = 1726$ ,  $p = .029$ ), with a small effect size ( $r = 0.189$ ).

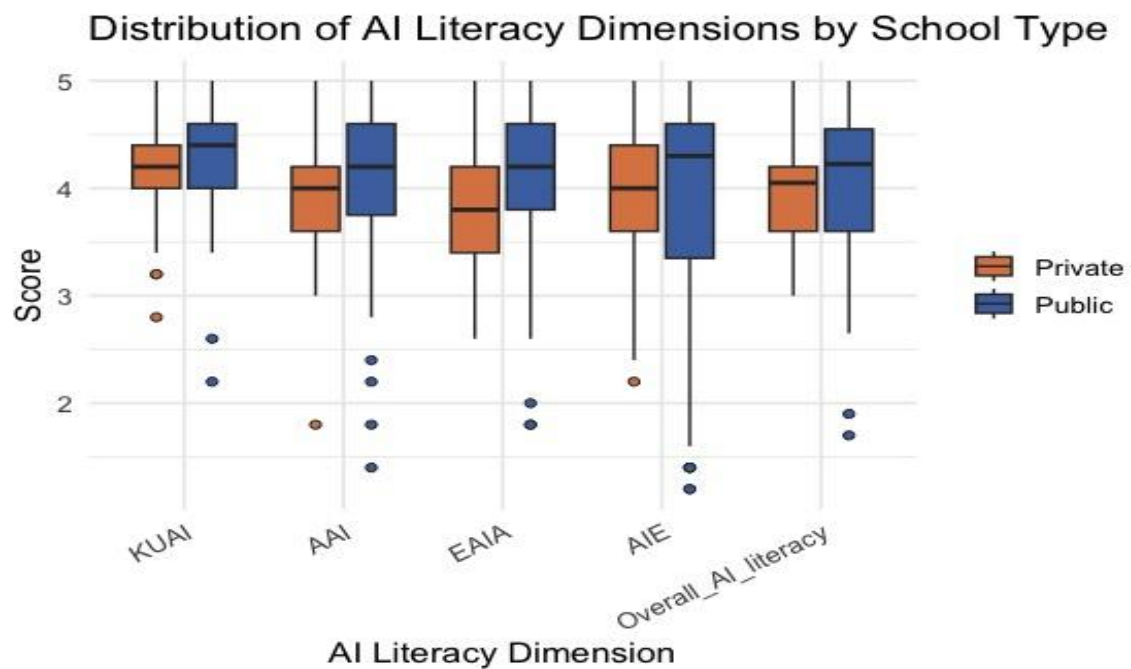
Table 4.2 Comparison of dimensional AI literacy across school types (Wilcoxon rank-sum test with Bonferroni correction)

|          | Public School |      |        | Private School |      |        |                 |              |                 |
|----------|---------------|------|--------|----------------|------|--------|-----------------|--------------|-----------------|
| Variable | Mean          | SD   | Median | Mean           | SD   | Median | W_<br>statistic | Effect<br>_r | p_<br>corrected |
| KUAI     | 4.27          | 0.48 | 4.4    | 4.12           | 0.44 | 4.2    | 1657            | 0.218        | 0.048*          |
| AAI      | 4.02          | 0.74 | 4.2    | 3.91           | 0.57 | 4      | 1799.5          | 0.161        | 0.252           |
| EAIA     | 4.02          | 0.76 | 4.2    | 3.78           | 0.55 | 3.8    | 1484            | 0.285        | 0.004**         |
| AIE      | 3.78          | 1.14 | 4.3    | 3.94           | 0.65 | 4      | 1994            | 0.085        | 1               |

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

To further explore what underpins this difference (Figure 4.1), a series of Wilcoxon rank-sum tests were conducted to compare public and private school teachers for each of the component four dimensions of AI literacy. Bonferroni correction was applied to adjust for multiple comparisons. As seen from Table 4.2, consistent with the overall AI literacy score, means and medians were higher for public schools for KUAI, AAI, and EAIA. These differences were statistically significant for KUAI and EAIA, but not for AAI. For AIE, the means were in the reverse direction, and the difference was not statistically significant.

Figure 4.1 Boxplots showing differences in overall AI literacy and the four dimensions across school types



#### 4.2. Differences in Perceived School Support

The second research question investigates the differences between public and private schools in term of how much support they have provided to meet teachers' needs for competence, autonomy, and relatedness (connection with other). Drawing on Lam et al.'s (2010) research, school support in the present study includes competence support, autonomy support, and collegial support. Analyses followed a similar procedure as used in the AI literacy section.

Table 4.3 Comparison of overall school support across school types (Wilcoxon rank-sum test)

|                        | Public School |      |        | Private School |      |        |                 |             |               |
|------------------------|---------------|------|--------|----------------|------|--------|-----------------|-------------|---------------|
| Variable               | Mean          | SD   | Median | Mean           | SD   | Median | W_<br>statistic | p_<br>value | Effect_<br>_r |
| Overall school support | 4.33          | 1.13 | 4.77   | 4.12           | 0.10 | 4.2    | 1794.5          | 0.062       | 0.162         |

As presented in Table 4.3, while both both public and private school teachers demonstrated relatively high levels of overall school support, with both median scores and mean scores above 4, teachers in public schools reported higher levels of overall school support (M=4.33, Mdn = 4.77) than their private school counterparts (M=4.12, Mdn = 4.20). The difference approached statistical significance ( $W = 1794.5$ ,  $p = .062$ ), and reflected a small effect size ( $r = .162$ ).

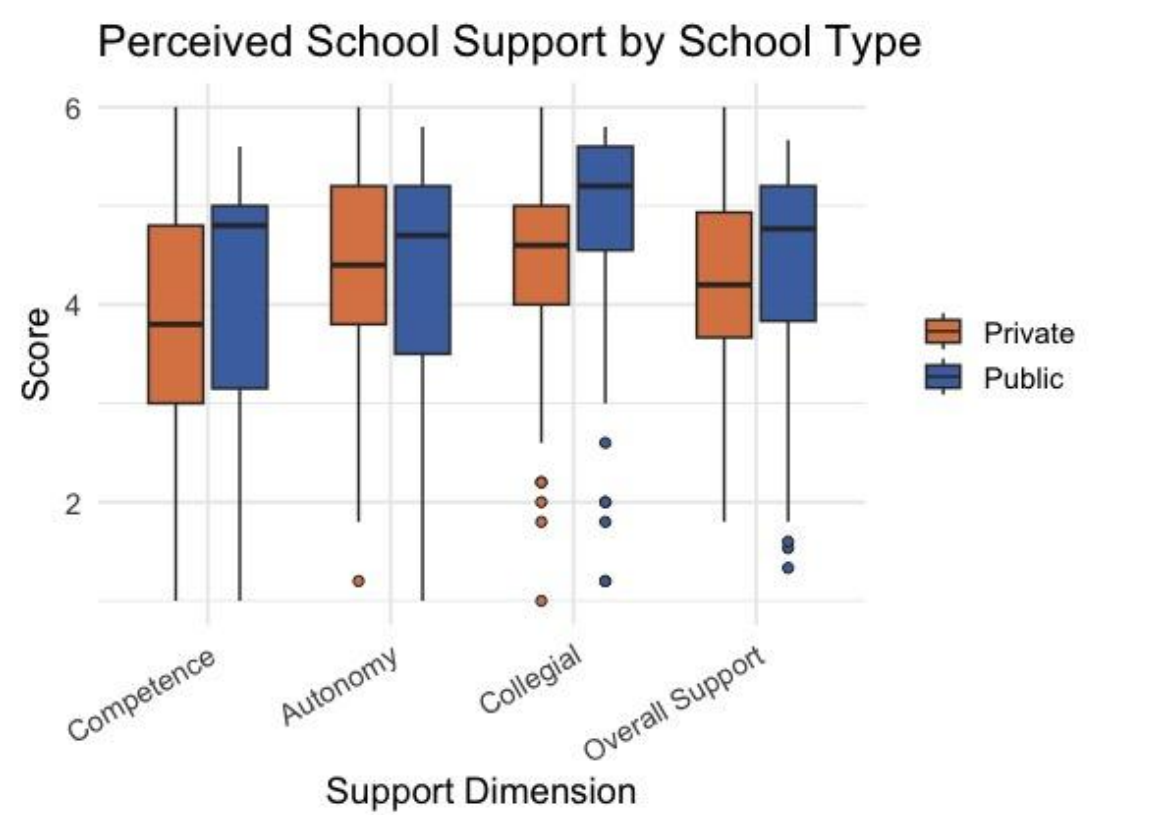
Table 4.4 Comparison of dimensional school support across school types (Wilcoxon rank-sum test with Bonferroni correction)

|            | Public School |      |        | Private School |      |        |                 |               |                 |
|------------|---------------|------|--------|----------------|------|--------|-----------------|---------------|-----------------|
| Variable   | Mean          | SD   | Median | Mean           | SD   | Median | W_<br>statistic | Effect_<br>_r | p_<br>corrected |
| Competence | 4.06          | 1.37 | 4.8    | 3.70           | 1.21 | 3.8    | 1718            | 0.193         | 0.079           |
| Autonomy   | 4.2           | 1.26 | 4.7    | 4.29           | 1.08 | 4.4    | 2190.5          | 0.008         | 1               |
| Collegial  | 4.75          | 1.15 | 5.2    | 4.34           | 1.07 | 4.6    | 1526            | 0.268         | 0.006**         |

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 4.4 and Figure 4.2 reveal that both public and private school teachers scored highest in collegial support and the lowest in competence support. Collegial support differed significantly across both school types ( $W=1526$ ,  $p=0.006$ ), with a small-to-medium effect size ( $r=0.268$ ). No significant differences were found in the other two types of support.

Figure 4.2 Boxplots showing differences in overall school support and the three dimensions across school types



### 4.3. Differences in Motivation for AI-Related CPD Activities

#### 4.3.1. Differences in Motivation Profiles

The third research question explores the differences between public and private school teachers' motivation for AI-related CPD. Five dimensions were measured: amotivation, external regulation, introjected regulation, identified regulation, and intrinsic regulation.

The overall motivation score for each participant was calculated as the average across all dimensions except amotivation. Autonomous motivation was defined as the average of identified and intrinsic regulation, while controlled motivation was defined as the average of external and introjected regulation. Analyses followed the same procedure as in the previous two sections.

Table 4.5 Comparison of overall motivation across school types (Wilcoxon rank-sum test)

|                    | Public School |     |        | Private School |      |        |                 |                |              |
|--------------------|---------------|-----|--------|----------------|------|--------|-----------------|----------------|--------------|
| Variable           | Mean          | SD  | Median | Mean           | SD   | Median | W_<br>statistic | p_ value       | Effect_<br>r |
| Overall motivation | 4.74          | 0.8 | 5.03   | 4.47           | 0.56 | 4.5    | 1431            | p<0.001<br>*** | 0.304        |

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001.

As shown in Table 4.5, while teachers from both school types scored high in overall motivation for AI-related CPD, public school teachers reported higher overall level (Mdn = 5.03) than private school teachers (Mdn = 4.50). The group difference was statistically significant ( $W = 1431$ ,  $p < .001$ ) and of medium effect size ( $r = .304$ ).

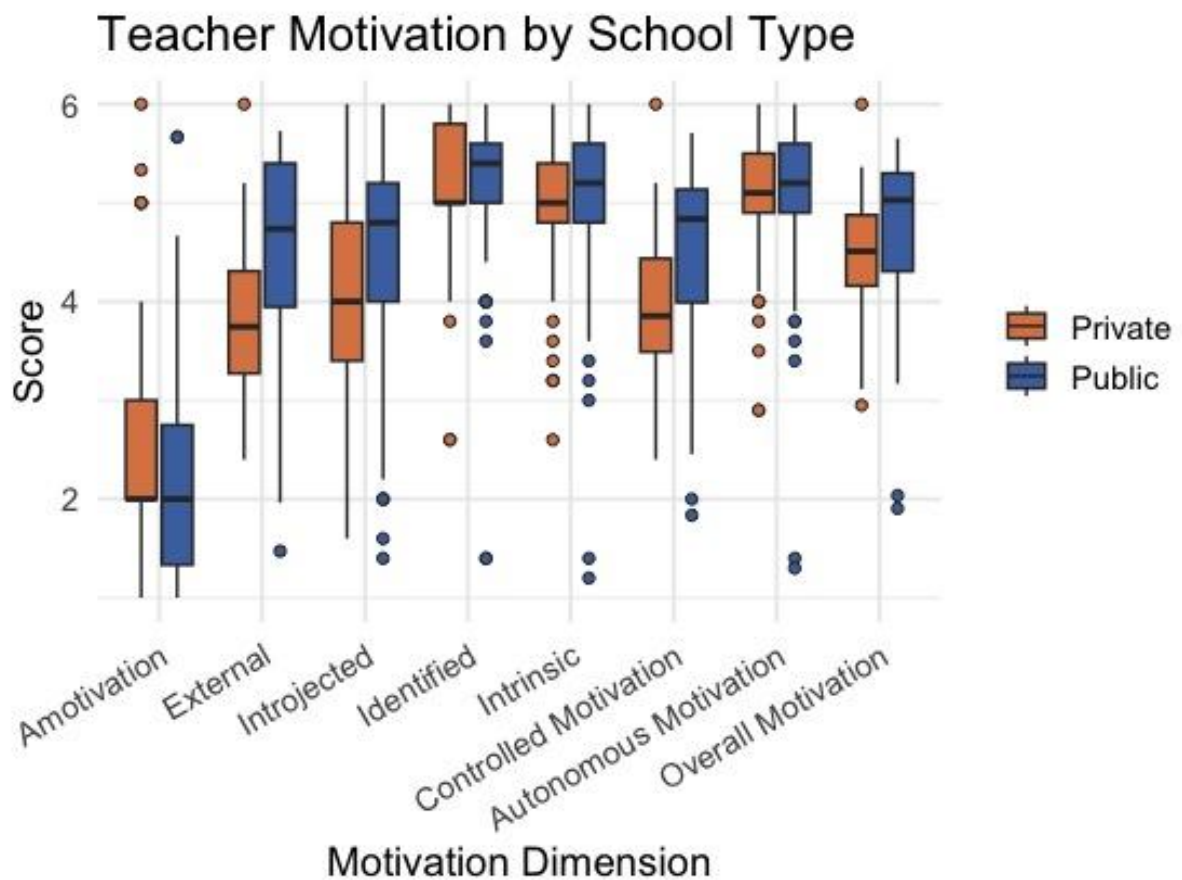
Table 4.6 Comparison of dimensional motivation across school types (Wilcoxon rank-sum test with Bonferroni correction)

|                          | Public School |      |        | Private School |      |        |                 |              |                 |
|--------------------------|---------------|------|--------|----------------|------|--------|-----------------|--------------|-----------------|
| Variable                 | Mean          | SD   | Median | Mean           | SD   | Median | W_<br>statistic | Effect<br>_r | p_correc<br>ted |
| Amotivation              | 2.17          | 1.11 | 2      | 2.57           | 1.18 | 2      | 2716.5          | 0.201        | 0.145           |
| External                 | 4.48          | 1.09 | 4.7    | 3.78           | 0.77 | 3.8    | 1225            | 0.385        | 0*              |
| Introjected              | 4.43          | 1.04 | 4.8    | 4              | 1.01 | 4      | 1559            | 0.255        | 0.023*          |
| Identified               | 5.09          | 0.87 | 5.4    | 5.15           | 0.71 | 5      | 2187            | 0.009        | 1               |
| Intrinsic                | 4.95          | 0.94 | 5.2    | 4.94           | 0.78 | 5      | 2040            | 0.067        | 1               |
| Controlled<br>motivation | 4.46          | 0.95 | 4.9    | 3.89           | 0.69 | 3.9    | 1217.5          | 0.388        | 0*              |
| Autonomous<br>motivation | 5.02          | 0.88 | 5.2    | 5.05           | 0.69 | 5.1    | 2036            | 0.068        | 1               |

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 4.6 and Figure 4.3 show that teachers from both groups reported the higher levels of autonomous motivation (identified and intrinsic) than controlled (external and introjected) motivation, with means and medians of approximately 5 and 4.5, respectively. Significant differences were found in controlled motivation and its two sub-dimensions, all with medium effect sizes, whereas no significant difference was found in controlled motivation and amotivation.

Figure 4.3 Boxplots showing differences in overall motivation, autonomous motivation, controlled emotions, and the five dimensions across school types



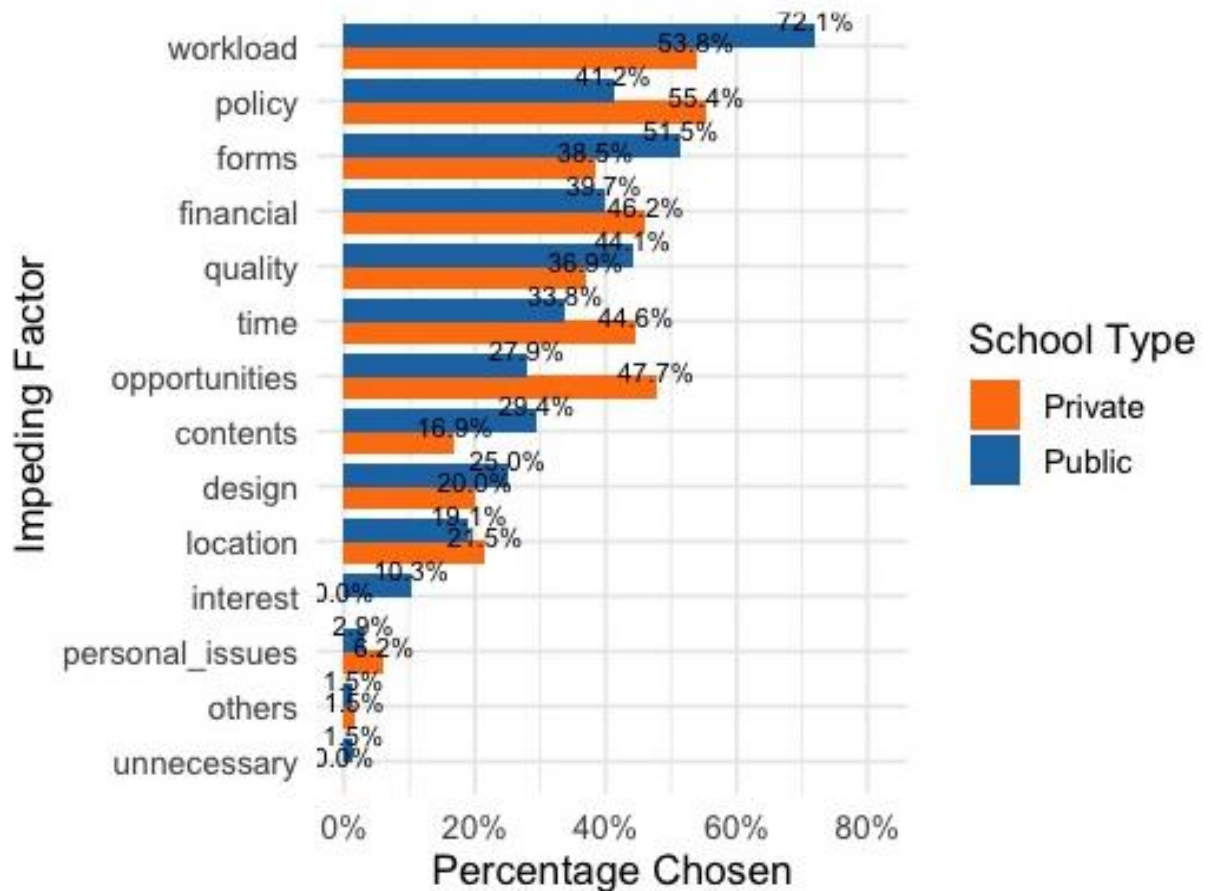
#### 4.3.2. Differences in Impeding Factors for AI-Related CPD

Besides Likert-scale data analyzed above, the questionnaire also included nine supplementary items in the form of multiple-choice, single-choice, and ranking questions, capturing participants' views on impeding factors, perceived differences between public and private schools, and responsibilities of stakeholders. Given the categorical and ordinal nature of the data, descriptive statistics were first used to summarize participants' responses, followed by relevant statistical analyses to further explore whether two groups of teachers differed in their choice distributions or response patterns.

As for this question, it is part of the third research question related to motivation, exploring factors that discouraging teachers from participating in AI-Related CPD.

Participants were asked to choose five out of 14 factors that they believed impeded their CPD participation. Figure 4.4 shows the percentages distribution of teachers selecting each impeding factor, comparing across the two school types.

Figure 4.4 Top impeding factors across school types



As shown in Figure 4.4, workload and policy-related barriers were among the top concerns for both groups, and financial constraints also featured in the top five for each. A Spearman's rank-order correlation was conducted to examine the similarity in the rankings of the percentage of teachers selecting each factor between public and private schools. The analysis showed a strong and significant correlation between the two sets of rankings,  $\rho = 0.798$ ,  $p < .001$ , indicating that factors ranked highly by public school teachers tended to also be ranked highly by private school teachers.

#### 4.4. Perceived Differences and Responsibilities

Besides the question on impeding factors analyzed above, this section presents the results of the other eight questions, which investigated teachers' overall perceptions of differences in the three key areas and their views on who should be responsible for those differences.

##### 4.4.1. Perceived Differences across School Types

Three questions focused on to what extent teachers perceived public and private schools differ in teachers' AI literacy, school support, and motivation for AI-related CPD. As shown in Figure 4.5, across all three areas, a substantial proportion of respondents perceived at least slight differences between public and private schools. Perceptions of significant differences were the highest for school support (32.3%), while “no difference” was reported most often for teachers motivation for AI-related CPD (36.1%).

Figure 4.5 Perceived differences across school types

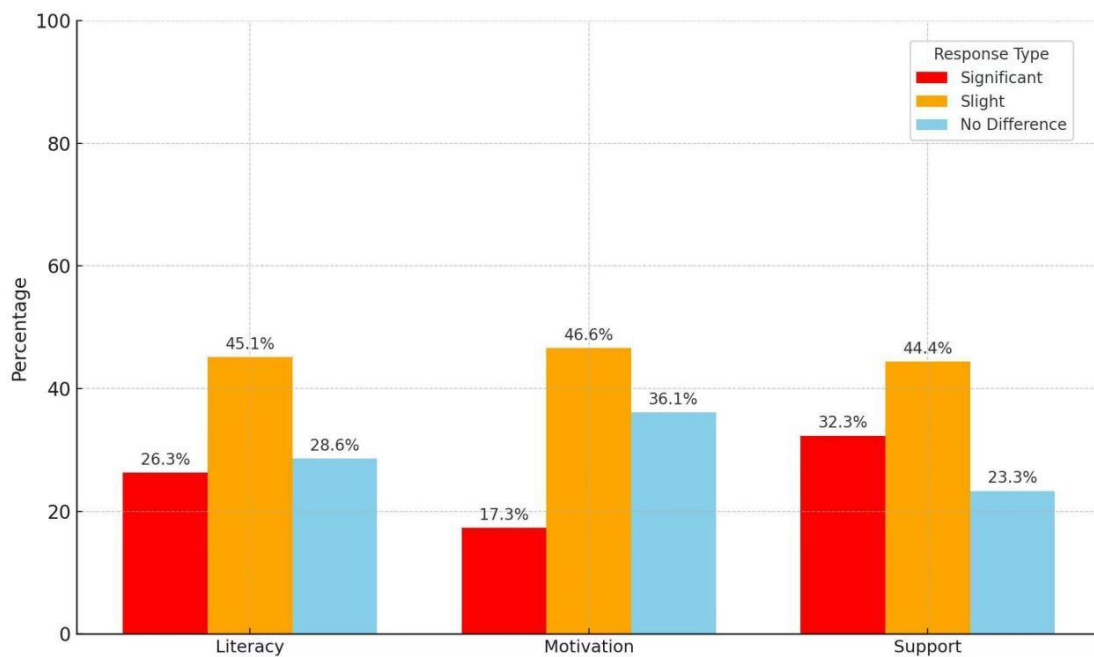


Table 4.7 Chi-square Tests Comparing Choice Distribution Regarding Perceived Difference across School Types

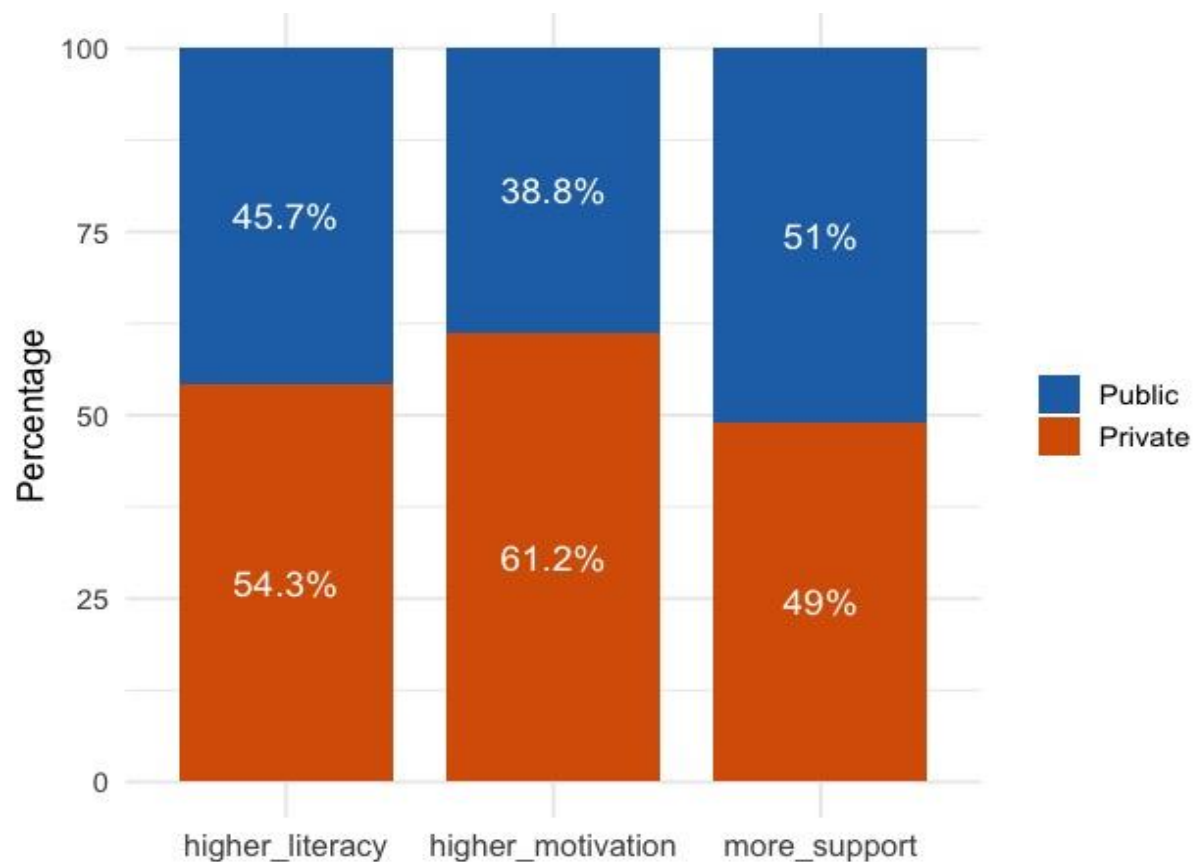
| Dimension                    | Chi_sq | df | p_corrected |
|------------------------------|--------|----|-------------|
| <b>Literacy difference</b>   | 0.190  | 2  | 1.000       |
| <b>Support difference</b>    | 2.273  | 2  | 0.9631      |
| <b>Motivation difference</b> | 4.280  | 2  | 0.353       |

As seen in Table 4.7, Chi-square tests revealed no statistically significant differences between public and private school teachers in the distribution of choices for perceived difference across the three areas (all  $p_{\text{corrected}} > .35$ ).

#### 4.4.2. Perceived Higher-Performing School Type in Three Areas

Three questions investigated teachers' perceptions on which groups of teachers had higher levels of AI literacy, school support, and motivation. Figure 4.6 presents the percentages of teachers who perceived specific school type demonstrating higher levels in each area. For AI literacy and school support, responses were nearly evenly split, with similar percentages of teachers selecting each type of school as having higher levels. In terms of motivation, a clear majority (61.2%) believed that private school teachers had higher motivation.

Figure 4.6 Perceptions of higher-performing school type in three areas



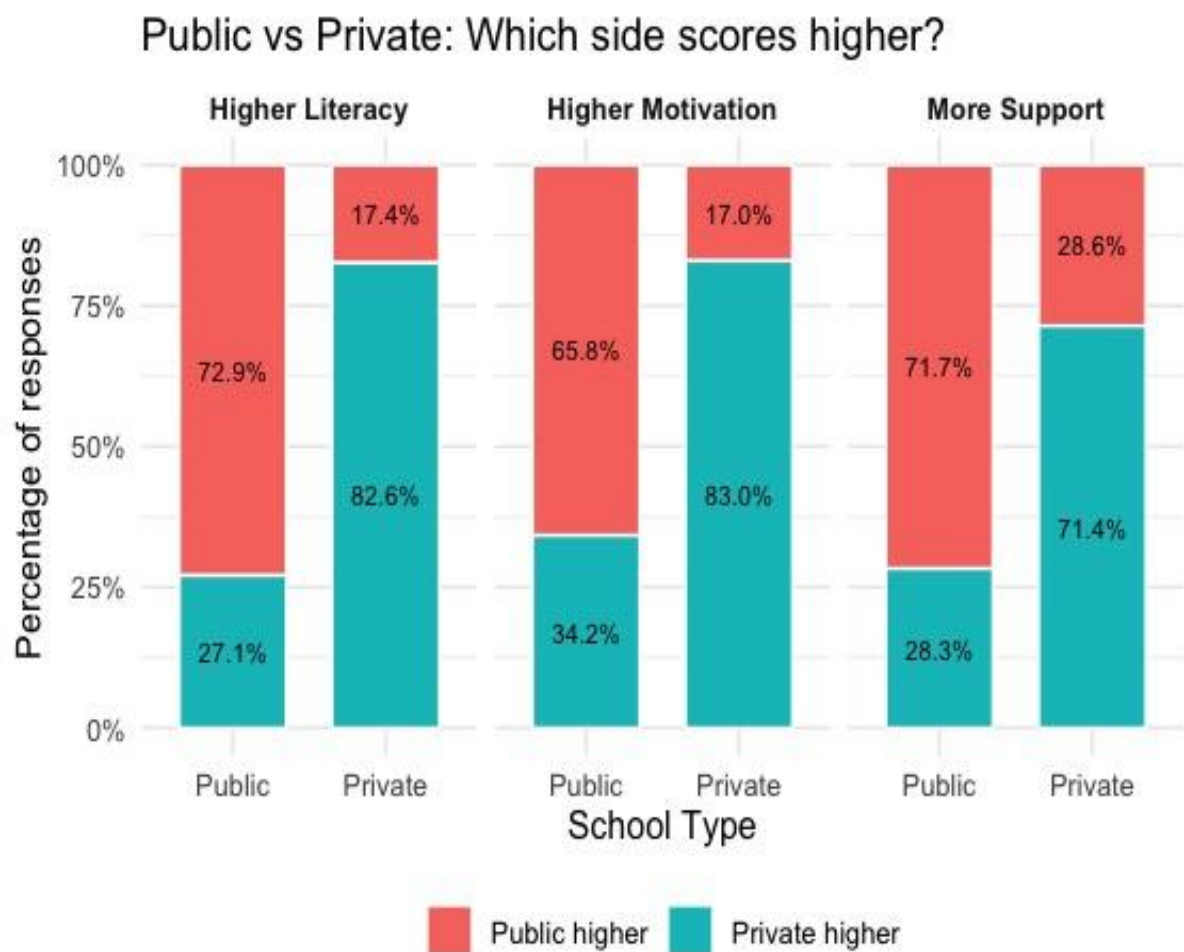
**Table 4.8** Chi-square tests comparing choice distribution regarding higher-performing school type across school types

| Dimension                | Chi_sq | df | p_corrected |
|--------------------------|--------|----|-------------|
| <b>Higher_literacy</b>   | 26.985 | 1  | p< 0.001    |
| <b>Higher_motivation</b> | 19.037 | 1  | p< 0.001    |
| <b>More_support</b>      | 17.263 | 1  | p< 0.001    |

However, Chi-square tests (Table 4.8) revealed significant differences between public and private school teachers in their choices of higher-performing school type across all

three areas (all  $p_{\text{corrected}} < 0.001$ ). This can be further illustrated by Figure 4.7, showing that teachers overwhelmingly selected their own group as having higher levels regarding all three areas.

**Figure 4.7** Perceptions of higher-performing school type in three areas across school types



#### 4.4.3. Perceptions on Whose Responsibilities for Differences

Two questions were included to investigate teachers' perceptions on who should be responsible for differences in teachers' AI literacy and motivation for AI-related CPD across school types. Participants were asked to rank relevant stakeholders.

Figure 4.8 Responsibilities for enhancing teachers' AI literacy and motivation

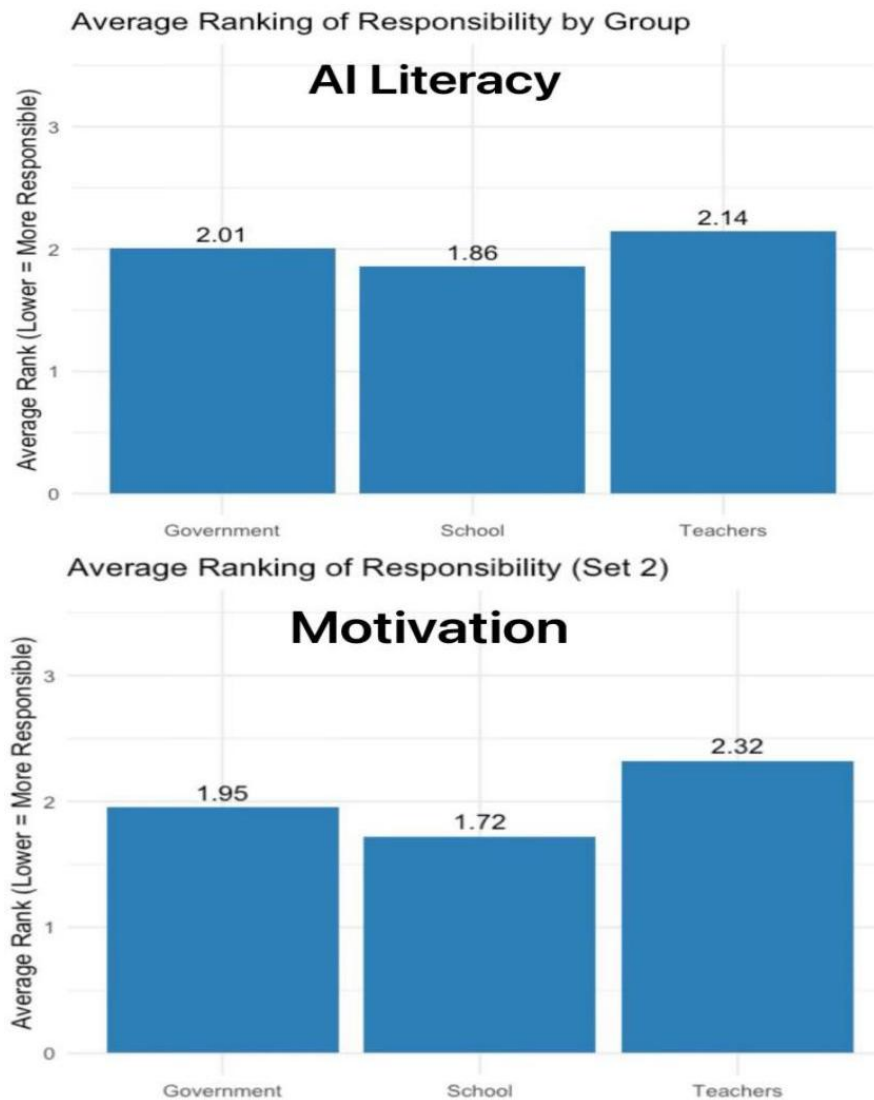


Figure 4.8 indicates a consistent perception that system-level stakeholders, particularly schools, carried the primary responsibility for both enhancing teachers' AI literacy and fostering their motivation, whereas teachers are seen as playing a more secondary role. Spearman's rank-order correlation further demonstrated such consistency, revealing a significant correlation between public and private school teachers' ranking patterns in these two areas (Table 4.9).

**Table 4.9** Spearman’s rank-order correlation for ranking patterns across school types

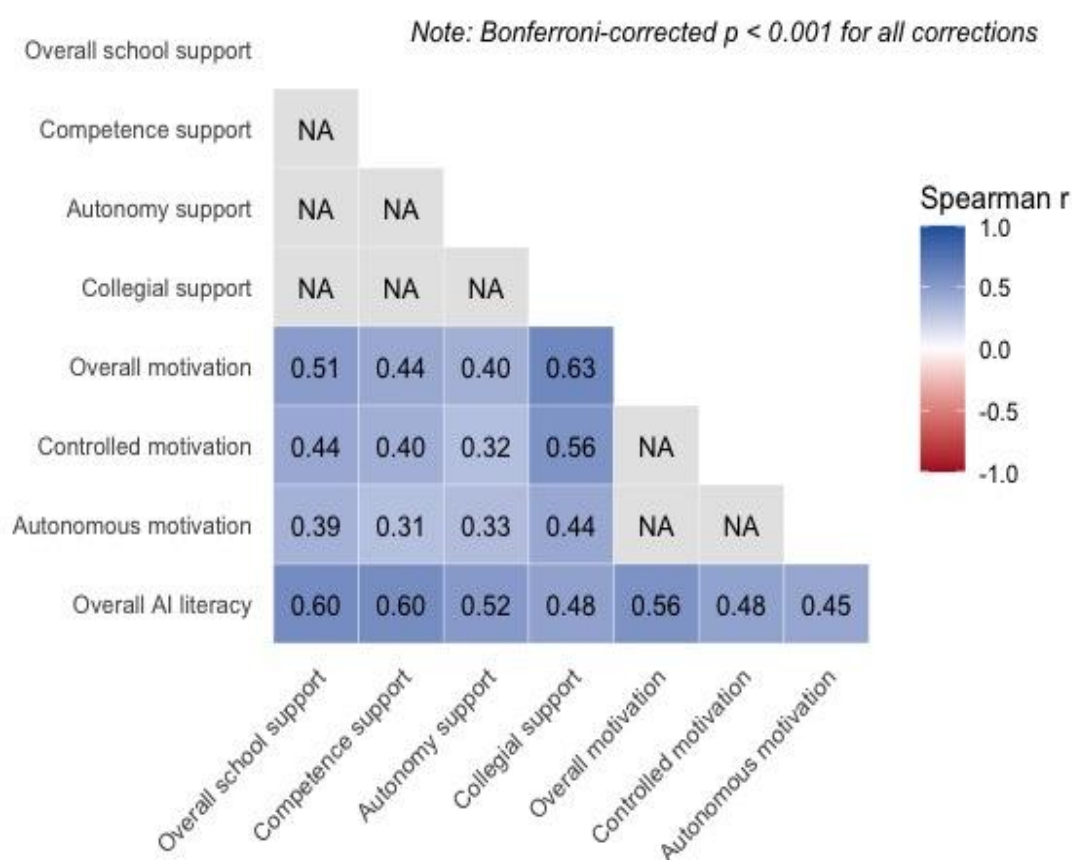
| Dimension                 | Rho_ρ | p_corrected |
|---------------------------|-------|-------------|
| <b>AI literacy</b>        | 0.866 | 0.667       |
| <b>Overall motivation</b> | 1.000 | 0.000       |

#### 4.5. Relationships Among Teachers’ AI Literacy, School Support, and Motivation

The fourth research question focuses on the relationships among teachers’ AI literacy, school support they receive, and their motivation for AI-related CPD activities. Given that the data for these variables were not normally distributed, as discussed in Section 3.7.1, Spearman’s rank-order correlations were used to examine the relationships among eight variables including overall AI literacy, overall school support, the three sub-dimensions of school support, overall motivation, controlled motivation, and autonomous motivation. Bonferroni correction was applied to adjust for multiple comparisons.

As shown in Figure 4.9, each pair of variables demonstrated significant correlation, with a range of effect sizes from moderate ( $\rho = .31$ ) to strong ( $\rho = .63$ ).

**Figure 4.9** Correlations across three areas and sub-dimensions



## 5. Qualitative Results

This chapter presents the qualitative results of the nine semi-structured interviews and one one-ended survey question. Interview participants are identified as PR1-4 and PUB5-9, with PR1-4 from private schools and PUB5-9 from public schools. Quotations are numbered 1-51. When citing quotations, the code “PUB7-49”, for example, means public school participant PUB7, quotation 49. Relevant interview quotations are presented in Appendix 13 according to different themes, with comparisons made between two school types.

## **5.1. AI Literacy**

### **5.1.1. Differences in AI literacy**

Two main themes were identified: conceptual understanding of AI literacy and levels of AI literacy. Differences between public and private school teachers emerged within both themes.

Regarding conceptual understanding, no participant from either type of schools spontaneously mentioned issues related to ethics as part of AI literacy. Teachers from public schools generally provided more specific and comprehensive definitions of AI literacy. For example, apart from ethics, participant PUB7 summarized all the other three aspects of AI literacy in detail, including the ability to “understand technical principals and concepts”, “apply and operate AI tools to write articles, conduct searches, retrieve information”, and “evaluate quality of the output and be able to combine the generated result with our own context to produce an effective outcome”(PUB7-1). In contrast, most private school teachers offer vague definitions, explaining AI literacy as the ability to “access” and “apply” AI tools for more effective teaching (PR4-4; PR1-5).

When asked about their AI literacy levels, most teachers from across both groups perceived their overall proficiency as average or even limited (PUB5-7; PUB7-8; PR4-10; PR3-12). However, they highlighted different AI competences they possessed. Public school teachers emphasized “in-depth understanding” of AI (PUB5-7), using AI tools “appropriately”(PR3-12), and “verifying information” (PUB8-9), indicating their awareness and ability to better understand and evaluate AI besides their application of AI. Private school teachers, on the other hand, reported less frequent use (PR3-12) or limited use for simple tasks (PUB7-8), and tended to accept AI outputs without substantial verification (PR4-10). Ethics-related abilities were rarely mentioned, with several explicitly stating that they “seldom consider issues related to ethics”(PUB8-9).

### **5.1.2. Reasons for Differences**

In line with the questionnaire results, most teachers perceived differences in overall AI literacy across two school types. Their explanations for such differences generally

pointed to factors at the school and government levels. School-related reasons mainly included “financial resources” (PUB9-13; PR4-15) and “training opportunities”(PR3-14), while government-related factors centered on “policies” (PUB7-16; PR1-18) and “national support” (PUB6-17).

Interestingly, when asked to share opinions on whether or why such differences existed, some teachers admitted knowing little about the other school type, yet still offered critical remarks about it. For example, private school teacher PR1 remarked that public school teachers were overly restricted by “certain boundaries and constraints” (PR1-18), while public school teacher PUB7 suggested private schools were “primarily profit-oriented” and thus to some extent failed to provide “planned and systematic activities” to develop teachers’ AI literacy (PUB7-16)

## **5.2. Perceived School Support**

### **5.2.1. Differences in School Support**

In terms of competence-related support, teachers from both school types reported receiving AI-related “training” (PUB7-19; PR2-20), mainly in the form of “lectures” which several considered sufficient but of limited practical value (PR3-21) or not aligned with teachers’ needs (PUB7-19). Public school teachers seemed to have more access to varied training opportunities than their private counterparts.

Regarding autonomy support, public school teachers were sometimes required to participate in training (PR3-23) but had the freedom to choose among various online and offline activities (PUB6-22). Private school teachers, however, participated in AI-related activities largely based on their own “interest and resources” (PR2-24), yet appeared to have limited access to additional support for developing their AI competence.

As for collegial support, public school teachers regularly received assistance from colleagues through routine meetings and research activities (PUB5-25), whereas private school teachers sought or provided support on their own initiative (PR2-27, PR4-26).

### **5.2.2. Reasons for Differences**

Differences in school support were perceived by most teachers from both school types, and they reported school and government-level reasons for such differences. School-related factors included financial burden” (PUB5-28; P9-29) and “school goals”(PR3-30), while government-related reasons centered on “government policy and its implementation” (PR1-32; PR4-33) that decided the amount and “mandatory” nature of some activities (PUB7-31).

## **5.3. Motivation for AI-Related CPD Activities**

### **5.3.1. Differences in Motivation for AI-related CPD activities**

Both external incentives and internal motivation were reported across school types as important motivating factors for teachers’ participation in AI-related CPD activities. Most frequently mentioned external factor was related to external rewards including “certificate, cash prize”(PUB9-34), and “salary increase” (PR3-36). Teachers participated in AI-related CPD also due to internal motivation, either identifying the benefits or helpfulness (PR4-41; PR8-39; PUB9-38) or driven by ‘curiosity’ and ‘enthusiasm’ (PUB7-40; PUB9-38). However, public school teachers tended to have stronger external motivation, frequently mentioning external incentives such as “pressure from authority departments”(PUB7-35) and “professional title evaluation”( PR3-37).

As for impeding factors, both groups consistently named workload as the most important factors (PUB9-42; PUB8-43; PR4-45). Other important factors were related to the duration, time, and quality of CPD activities (PUB5-44, PR3-46).

### **5.3.2. Reasons for Differences**

Most interviewees perceived differences in teachers’ motivation for participating in AI-related CPD activities. These differences were attributed to factors at the individual, school, and government levels. The most influential factor was institutional, with top-down “policy” (PR4-51) and “requirements” (PUB5-50, PUB9-48) shaping teachers’

participation. At the individual level, differences were related to variations in the nature of teachers' motivation, with some teachers having stronger "ideals and aspirations" (PR3-47).

#### **5.4 Strategies to Improve Teachers' AI Literacy and Motivation for AI-Related CPD**

This section reports responses to the open-ended question in the online questionnaire, which explored strategies for improving teachers' AI literacy and motivation for AI-related CPD. A detailed list of sample strategies, derived from the thematic analysis, is presented in Appendix 12.

To enhance AI literacy, most teachers identified relevant CPD activities as an effective solution. Three main strategies emerged: providing more practice-oriented CPD activities, offering diverse forms and content, and designing CPD based on teachers' needs. Other suggested measures included updating equipment and providing additional resources, such as technical and staff support.

To better motivate teachers' participation in such activities, respondents referred to both external incentives and internal motivation. Suggested external incentives included policies/honors/rewards, competitive opportunities, and peer assistance. Enhancing teachers' awareness of the value of AI-related CPD and fostering a sense of achievement through participation were proposed as effective ways to enhance intrinsic motivation.

### **6. Discussion**

This study adopted a mixed-methods approach to examine to what extent Chinese Chinese public and private school English teachers differ in three key areas: AI literacy, school support they receive, and their motivation to participate in AI-related CPD. While these aspects related to AI have received increasing attention in recent years, limited research has been conducted to investigate relevant experiences or conditions of teachers, and even fewer studies have touched upon the comparison between different types of schools. Drawing on observations of the Chinese educational context, the present study anticipated finding

significant differences in all three areas. Subsequent analyses of both quantitative and qualitative data revealed some differences across each area, to some extent confirming the initial assumption. This chapter synthesizes and discusses findings from both types of data in relation to the key research questions and relevant literature, and outlines their implications.

## **6.1. To What Extent Teachers Differ in AI Literacy**

### **6.1.1. Common Patterns across School Types**

Quantitative findings indicated that both public and private school teachers in this study reported relatively high overall AI literacy, consistent with two mixed-methods studies on language teachers' AI literacy by Ma et al. (2024) and Wang and Pei (2025). However, this contrasts with earlier studies that identified comparatively low AI literacy among pre-service teachers (Li et al., 2023; Yoon & Yang, 2024). One possible explanation may be the rapidly increasing exposure to AI technologies in educational contexts in recent years, which may have enhanced teachers' self-reported competences. Variations across studies may also be related to differences in research contexts and participant profiles. The present study was conducted among English teachers, who may hold more positive attitudes and be more receptive to AI technologies (Molefi et al., 2024), and in four tier-1 meg-cities in China, where teachers can have greater access to AI-related exposure and resources, which may contribute to higher AI literacy. All these factors can contribute to the relatively high overall AI literacy. However, these self-reported high scores may not reflect actual proficiency in effectively, critically and ethically using AI, as self-reported measures are prone to various biases. For example, it is likely that teachers are overestimating their own abilities, or they have different understanding of the item descriptions such as “easily”, “effectively” and “sufficient”, which could result in scores exceeding their actual proficiency. In this sense, caution is needed when interpreting these results.

Qualitative data reinforced the need for caution, suggesting a more nuanced interpretation of the high performance in overall AI literacy. In the interviews, many teachers described their AI literacy as average or below average, reporting their limited understanding and use of AI. This discrepancy between their self-assessments and scale-based results probably stemmed

from their vague and incomplete conceptualization of AI literacy, as reflected in their partial and sometimes fragmented descriptions of the construct in the interviews. .

Across the four dimensions of AI literacy, KUIAI (Knowing and Understanding AI) scored the highest for both school types. However, this high performance should be interpreted with caution. First, the Cronbach's alpha for items assessing this dimension was acceptable yet relatively low, which may have affected the reliability of the results. Furthermore, high scores in KUIAI don't mean that teachers' have in-depth understanding of AI, as Pei et al. (2025) found that teachers' in-depth understanding of AI mechanisms was weak although they possessed strong knowledge of general AI concepts. In the questionnaire of the present study, items under the dimension of KUIAI tended to assess the general understanding of AI (e.g. I can identify AI technologies), rather than more complex AI mechanisms. In this light, high KUIAI scores in the present study may reflect a superficial rather than a comprehensive and in-depth understanding of AI. Qualitative data also supported this interpretation, as participants expressed their need for in-depth understanding of deep principles or mechanisms of AI or reported their limited competence to use AI, reflecting a surface-level understanding. Therefore, to better understand teachers' in-depth knowledge, which plays a critical role in their confidence in applying AI (Pei et al., 2025), further research is needed.

By contrast, AIE (AI Ethics) received relatively low scores in both groups, echoing earlier studies (Ayanwale et al., 2024; Pei et al., 2025). In the qualitative data, AIE was never mentioned spontaneously as part of the conceptualization of AI literacy. Furthermore, ethical issues were partially or even rarely realized or considered by the interviewees when they applied AI. These suggested that ethical considerations remain peripheral in teachers' conceptualization of AI literacy, highlighting the need to integrate AIE more explicitly into AI-related CPD or school policy to increase awareness.

#### **6.1.2. Differences between Public and Private Schools**

Despite these common patterns, quantitative data revealed several statistically significant differences between the two groups. Public school teachers scored significantly higher than private school teachers in overall AI literacy, KUIAI, and EAIA (Evaluating AI Application). This was also evident in qualitative data. When asked to define AI literacy in the interviews,

public school teachers tended to provide more comprehensive definitions that encompassed multiple dimensions of the construct, while private school teachers often described a narrower set of abilities and were less likely to mention evaluation of AI application. These differences, based on both types of data, were largely related to teachers' access to institution support ranging from top-down policy, financial support, to AI-related CPD opportunities. This aligned with previous studies (Kohnke et al., 2025; Laupichler et al., 2022; Su et al., 2023) that reported a widespread lack of relevant support for teachers' AI literacy development and highlighted the importance of sufficient support to meet teachers' need for AI literacy development.

However, interestingly, regarding which group they believed had higher AI literacy, a statistically significant difference emerged, with both groups overwhelmingly selecting their own school type. The same pattern was observed for perceptions of higher school support and motivation levels. This pattern may be explained by in-group bias (Tajfel & Turner, 2004), whereby individuals tend to evaluate their own group more favorably than out-groups. Interview responses further illustrated this, as some participants acknowledged knowing little about the other school type, yet still made some critical remarks about it. These findings indicated that teachers' perceptions are shaped not only by direct experience but also by professional identity and school type affiliation, which may reinforce existing stereotypes and biases. Therefore, caution is needed to interpret self-reported data collected through surveys and interviews. To have a more objective and comprehensive picture of teachers' AI literacy, future research could explore, validate and adopt objective measurements, as Ding et al.(2024b), who developed 25 objective-based items in the form of multiple-choice questions, true/false statements, and sorting inquiries to assess teachers' AI competences. However, such measurements, together with commonly used subjective measurements, need to be further validated through diverse statistical approaches and tested in different cultural contexts (Lintner, 2024).

## **6.2. To What Extent Teachers Differ in School Support**

### **6.2.1. Common Patterns across School Types**

Both public and private school teachers rated the overall school support they received for AI literacy development at moderately high levels. This relatively positive ratings contrasts with some earlier studies, which identified the scarcity of institutional support for AI-related CPD (Kohnke et al., 2025; Laupichler et al., 2022; Su et al., 2023). One possible explanation is that schools in the present study's context (tier 1 mega cities) may indeed offer more support than those less resourced areas. However, the contrast may also stem from reporting bias or limitations of the measurements, calling for cautious interpretation. Consistent with this concern, qualitative data revealed that many interviewees still found it difficult to access relevant CPD activities or to gain the support they needed. This suggests a gap between perceived adequacy in survey responses and teachers' experiences.

Regarding the three dimensions of support, collegial support emerged as the highest-rated aspect across both groups, while competence support scored the lowest. The reliance on collegial support was evident in interview responses, where teachers reported routine teaching-research group meetings and peer sharing as important channels to gain AI knowledge. While collegial support can contribute to higher AI literacy (Chiu et al., 2024), over-reliance on it could potentially limit teachers' access to expert-led professional development, particularly when institutional competence support is insufficient. The lack of sufficient competence support was reflected in the interview accounts, where teachers mentioned that the majority of AI-related CPD activities were in the form of one-off lectures that they found unhelpful. Such formats often lack characteristics associated with effective CPD activities, such as relevance to teaching practice and goals, opportunities for corroboration, and sustained course duration (Murray, 2014). To better facilitate development of competence, high-quality CPD programs are thus needed.

### **6.2.2. Differences between Public and Private School**

Regarding the differences in overall school support across school types, no statistically significant difference was identified in the quantitative analysis of the Likert-scale responses.

However, in the separate single-choice question asking participants to what extent they believed school support differed across school types, consistent responses were provided by teachers from both types of school, with the majority of participants perceiving at least slight differences and a large number of them perceiving significant differences. The analysis of qualitative data may offer some potential explanations for this disparity.

In interviews, when teachers were asked to reflect on the school support they received, the support they mentioned included training to learn how to use AI, colleagues' help with AI integration in teaching, or lectures to identify their weaknesses. These kinds of support, based on Lee et al. (2020), were more likely to be "perceived principal's learning support" that encompassed the principal/leader offering opportunities for skill development, helping identify training needs, offering improvement suggestions, and coaching in self-directed problem-solving, rather than support for their three basic psychological needs for competence, autonomy, and relatedness (feeling connected (Ryan & Deci, 2020)). Such different understandings of the construct may contribute to the divergence between the scale-measured results and the results for the separate question, and the seemingly contradictory data collected through the separate survey question should be interpreted with caution.

However, interview participants reported that they perceived differences between two types of school, also contradictory to the Likert-scale data results. Therefore, future studies may include data obtained from institutional documents or direct observations to have a more comprehensive understanding of the differences.

Despite no significant differences identified in overall school support, public school teachers reported significantly higher levels of collegial support than their private counterparts. Interview accounts shed light on this gap. Public school teachers reported more collegial support probably because they were more strictly regulated by school-level policy requirements (e.g. weekly academic group meetings) that enhance connection and collaboration. In contrast, private school teachers tended to rely more on self-initiated interactions, which gave them more autonomy but less sustained collegial support. Then the issue may be how to achieve a balance between autonomy and structured opportunities, ensuring that collaboration is frequent and meaningful without becoming too restrictive.

Based on the interviews, the reasons for these differences appeared rooted in institutional factors, including financial support, policy priorities, and school goals, echoing those

shaping disparities in AI literacy. Such consistency highlighted the critical role of both the government and the school in promoting equality between two types of schools. Without their effective involvement, individual teachers have limited agency to shape structural conditions.

### **6.3. To What Extent Teachers Differ in Motivation for AI-Related CPD**

#### **6.3.1. Common Patterns across School Types**

Research on teachers' motivation for general CPD is well established (e.g. Celleja, 201; MaMillan et al., 2016; Zhang et al., 2021), yet empirical studies focusing specifically on AI-related CPD remains scarce. Limited existing studies often suffer from relatively poor research design and presentation of results, as seen in Indrayani et al., 2024; Tang et al., 2015. Against this backdrop, the present study offers some of the first evidence on teachers' motivational profiles for AI-related CPD.

Both public and private school teachers reported relatively high overall motivation to participate in AI-related CPD, consistent with Tang et al.'s (2025) study focusing on older adults' motivation to AI literacy education. Importantly, both autonomous (e.g.interest, improvement) and controlled motivation (e.g. rewards, policy, pressure) scored highly, suggesting that both types of motivation operate alongside each other to achieve high motivation. This supports Jamaliade and Fatehi Rad's (2022) claim that while intrinsic motivation plays a critical role in teachers' CPD engagement, extrinsic motivation also contributes meaningfully.

However, autonomous motivation consistently exceeded controlled motivation across both school types, echoing Celleja's (2018) and Yang's (2021) findings that teachers were largely intrinsically motivated by their desire for both personal and professional development. This pattern may indicate the possibility for long-term engagement, as intrinsic motivation is generally more long-lasting and linked to more sustained professional learning (Deci & Ryan, 2020).

However, consistently high self-reported motivation should be interpreted with caution, as having motivation to participate in CPD does not necessarily lead to active participation,

especially when substantial barriers exist. Both groups ranked similar top five impeding factors primarily related to institutional conditions (e.g. workload, policy) and CPD provision (e.g. time, quality, forms). Interview accounts also highlighted these barriers, with heavy workload perceived as the most pressing challenge that left teachers no time or energy to participate in AI-related CPD. These barriers, if not addressed properly, may prevent teachers from actively engaging in AI-related CPD.

### **6.3.2. Differences between Public and Private Schools**

Significant differences between different school types were also identified. Public school teachers reported significantly higher overall motivation than their private school counterparts, with the largest disparity in controlled motivation. This suggests that public school teachers are subject to stronger external incentives, such as mandatory participation linked to requirements, policy, performance evaluation, or professional title promotion, as reflected in qualitative data.

However, these external incentives may be a double-edged sword. They can function as effective triggers for engagement but may also restrict teachers' autonomy, making it difficult for teachers to tailor learning to their specific interests or needs. Private school teachers, by contrast, reported fewer externally imposed requirements, which explained their lower controlled motivation yet similarly high autonomous motivation. However, this relative freedom often comes along with more limited institutional support, thereby constraining their overall engagement in AI-related CPD. The challenge may lie in how to design support systems that maintain necessary regulation yet ensure sufficient autonomy, enabling teachers to draw on the benefits of both controlled and autonomous motivation. Achieving this will require the active involvement of both the government and school.

Regarding reasons for differences in teachers' motivation for AI-related CPD, the qualitative data results were consistent with those of AI literacy and school support. Teachers appeared to consistently attribute variations in motivation for AI-related CPD largely to institutional factors such as policies, funding, or CPD provision, highlighting the critical role of institutional support in shaping teachers' experiences in those three areas.

#### 6.4. Relationships across Three Key Areas

A notable pattern identified in the present study was the consistent positive correlations among school support, AI literacy, and motivation to participate in AI-related CPD.

Overall school support as well as all three dimensions positively correlated with overall motivation, autonomous motivation, and controlled motivation, consistent with Lam et al.'s (2010) findings. Similarly, school support and its three sub-dimensions positively correlated with overall AI literacy, consistent with Chiu et al.'s (2024) study. However, in terms of the predictive role of collegial or relatedness support in AI literacy, the present result contrasted with Wu et al.'s (2025) findings, which reported no significant correlation between the two. One potential explanation for the variations may be related to the differences among the participants. To be specific, secondary school teachers in Chiu et al.'s and the present study may rely more on collegial networks and peer collaboration to learn, while university teachers in Wu et al.'s study tended to work and learn more independently. Such variations in research findings suggest that collegial support may function differently across educational contexts. This highlights the need for further research to explore whether, and in what way, factors such as teachers' profiles influence its role.

Both overall motivation and its autonomous and controlled forms were found to be positively correlated to AI literacy. While limited research focused on the direct relationship between motivation for AI-related CPD and AI literacy, many studies have supported the positive role of motivation, particularly autonomous motivation, in predicting teachers' engagement in CPD activities (Gorozidis & Papioannou, 2014; Wal et al., 2014). In this light, based on this finding of the present study, it is likely that motivation for AI-related CPD can indeed facilitate their engagement in relevant CPD activities, and thus enhancing the development of AI literacy. However, more research can be conducted in the future to further explore their relationships and underneath mechanisms.

The consistently positive correlations among three constructs indicate a potential reinforcing cycle, where supportive environments promote motivation, which in turn facilitates the development of AI literacy. From initial motivation to actual engagement in AI-related CPD and subsequent improvement of AI literacy, it's likely that the school support for teachers'

basic psychological needs for competence, autonomy, and relatedness play a critical role, as suggested by Self-Determination Theory (Ryan & Deci, 2000). In this light, future research can attempt to test the potential causal direction of these relationships using intervention or longitudinal designs to clarify the mechanisms underlying these consistent correlations. Such work may also shed light on the design of policies or practices that can simultaneously strengthen institutional support, teacher motivation, and AI literacy.

### 6.5. Limitations

The first limitation of the present study is related to sampling. First, the sample size (133 survey responses from approximately 55 schools and nine interview participants), while reasonable, is relatively small and may not fully represent the population of public and private school English teachers in the four tier 1 mega-cities in China. This may reduce the statistical power and limit the generalisability of findings. In addition, the use of snowball and convenience sampling may have introduced self-selection bias, potentially over-representing teachers who had existing connections with the researcher or were exposed to similar school conditions. Moreover, as both the survey and interviews were conducted online, the study may have inadvertently excluded or discouraged participation from teachers who are less comfortable using new technologies including AI. This exclusion could lead to biased the sample toward participants who are more AI literate, thus under-representing the perspectives of teachers with lower AI literacy.

Second, the present research focused exclusively on the influence of school types on the differences in three key areas, without considering other potentially influencing factors including age, years of working, or gender. Notably, the respondents and interviewees in the present study were predominantly female, which may limit the generalisability of the findings to male teachers. In addition, it is likely that teachers' of different age ranges may have varying levels of interest in new technologies, potentially affecting their AI literacy and motivation to relevant CPD activities. Future research should account for such demographic variables to provide a more nuanced understanding.

Furthermore, the binary categorization of Chinese secondary schools into public and private may oversimplify the reality. Indeed, substantial differences can exist among schools within

the same category, or there may be additional sub-types under each broad classification. The absence of controls for such within-group differences may influence the interpretation of the findings.

Finally, while all scales employed in the questionnaire have been validated in previous research, the Cronbach's alpha for one dimension (Knowing and Understanding AI) of the AI literacy scale was acceptable yet relatively low, which may have affected consistency and reliability of the measurement. In addition, in the interviews, teachers were asked several times whether differences existed between public and private schools. This repeated framing may have introduced priming effect, prompting participants to be more likely to perceive such differences and resulting in biased perspectives.

## **7. Conclusion and Implications**

Drawing on the observed differences between Chinese public and private schools, the transformative potential of AI in education, and the critical role of teachers in educational change, this study aimed to examine differences between the two school types in three domains: teachers' AI literacy, the school support they receive, and their motivation to participate in AI-related CPD. The research was conducted in four economically comparable tier-one mega-cities in China, which are frequently discussed together due to their similar development status. A mixed-methods design was adopted to obtain a comprehensive understanding, combining 133 questionnaire responses with nine semi-structured interviews. Based on Ng et al.'s (2021a, 2021b) four-dimension conceptualization, AI literacy was assessed in terms of Knowing and Understanding AI (KUAI), Applying AI (AAI), Evaluating AI Application (EAIA), and AI Ethics (AIE). Guided by Ryan and Deci's (2020) Self-Determination Theory, the present study also examined three types of support (competence, autonomy, and collegial support) and five types of motivation (amotivation, external, introjected, identified, and intrinsic).

Analyses confirmed the initial assumption that significant differences exist across the three domains. Quantitative results revealed that public school teachers scored significantly higher than their private school counterparts in overall AI literacy, KUAI, EAIA, collegial support, overall motivation, and controlled motivation (external and introjected), and this was

supported by thematic analyses of interviews. These findings pointed to inequalities between school types that may require joint action from both government and school leadership to address.

At the same time, several common patterns emerged across school types. Quantitative findings showed that teachers from both public and private schools demonstrated relatively high levels of overall AI literacy, school support, and motivation, with the quantitative results of first two contradictory to relevant qualitative findings. In terms of AI literacy, both groups performed best in knowing and understanding AI but weakest in AI ethics, highlighting a specific area in need of attention. Moreover, Over-reliance on collegial support in both groups suggested that teachers lacked sufficient access to expert-led professional CPD. Furthermore, motivation profiles revealed that teachers were largely driven by autonomous motivation (identified, intrinsic), which can facilitate teachers' sustained engagement in AI-related CPD. However, such motivation would be undermined if issues related to workload, policy, and CPD provision cannot be properly addressed. In addition, positive correlations were consistently observed among AI literacy, school support, and motivation, as well as among some of their sub-dimensions, suggesting interconnectedness between these constructs. Such correlations underscore the importance of need-satisfaction support in shaping teachers' AI literacy and motivation for engagement in relevant CPD, shedding light on future designs of institution-level policies and practices. Future research can explore more on the causal directions among constructs to understand the underlying mechanisms.

These findings contribute to the limited body of research on teachers' AI literacy, school-based support, and motivation for AI-related CPD, particularly in the Chinese EFL context. While previous studies have often examined these constructs in isolation or from a student perspective, this research valued teachers' voices and situated them within the contextual realities of different school types. In doing so, it outlines teachers' specific strengths and weakness in AI literacy, offering insights for the design of effective AI-related CPD activities that address their specific. More importantly, it reveals disparities in the school support available to teachers, providing guidance for the governments and schools on how to better support and thus motivate teachers to enhance their AI literacy through relevant CPD.

While valuable, the findings should be interpreted with caution due to limitations such as the relatively small sample size and flawed instrument. Future research should employ larger and more diverse samples, refine measurement tools, and explore a broader range of contexts, including rural and less-developed regions. The influence of relevant factors such as age, teaching experience, and gender can also be further explored. Longitudinal and intervention studies could further clarify causal pathways among institutional support, teacher motivation, and AI literacy.

Overall, as AI continues to transform education, ensuring that teachers are both capable of using these technologies effectively, critically, and ethically is vital. This study makes an initial attempt to understand teachers' AI literacy profiles and their motivation for AI-related CPD in the Chinese EFL context. While the findings need to be interpreted with caution, they help bring existing inequalities to light, which may serve as the starting point for fostering more equitable conditions across diverse school types and educational contexts.

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## Appendix 1: Demographic Information

|                        |                                         | Num ber |
|------------------------|-----------------------------------------|---------|
| Gender                 | Male                                    | 104     |
|                        | Female                                  | 29      |
| Educational background | Bachelor                                | 35      |
|                        | Master                                  | 84      |
|                        | Above master                            | 14      |
| Years of working       | 1-3 years                               | 28      |
|                        | 4-10 yers                               | 72      |
|                        | Above 10 years                          | 33      |
| Age range              | under 25                                | 9       |
|                        | 25-34                                   | 63      |
|                        | 35-44                                   | 53      |
|                        | 45-54                                   | 8       |
| Educational stage      | Junior high school                      | 93      |
|                        | Senior high school                      | 40      |
| School type            | Public                                  | 68      |
|                        | Private                                 | 65      |
| Location               | Beijing                                 | 28      |
|                        | Shanghai                                | 28      |
|                        | Guangzhou                               | 53      |
|                        | Shenzhen                                | 24      |
| Professional roles     | English teacher                         | 67      |
|                        | English teacher+ 1 administrative role  | 50      |
|                        | English teacher+ 2 administrative roles | 7       |
|                        | English teacher+ other roles            | 9       |

## Appendix 2: Questionnaire

### Part 1

1. Information sheet & Informed consent

信息说明&知情同意

### Part 2

2. Please leave your email address below, and we may send you an invitation to a follow-up online interview in May and June 2025.

请留下您的电子邮件地址，我们可能会在 2025 年 5 月和 6 月邀请您参加后续的在线访谈。

3. Would you like to participate in the follow-up interview?

您愿意参加后续访谈吗？

Yes, I'd love to. 是的，我愿意参加。

Possibly. 有可能。

No, thanks. 不，谢谢。

4. Would you like to receive the results of this research?

你希望收到研究结果吗？

Yes, please send me the results.

是的，请给我发送研究结果。

No, thanks.

不用了，谢谢。

### Part 3: AI literacy

Please indicate to what extent do you agree or disagree with the following statements.

请说明您在多大程度上同意或不同意以下陈述。

Strongly disagree, disagree, neutral, agree, strongly agree 1-5

**人工智能素养（1=非常不同意；5=非常同意）**

5. Knowing and Understanding AI

I can distinguish between smart educational devices and non-smart educational devices.

我能区分智能教育设备和非智能教育设备。

I know where educational AI can support my teaching or professional work.

我知道教育 AI 在哪些方面能辅助我的教学和工作。

I can identify AI technologies in educational products.

我能识别教育产品中的 AI 技术。

I feel comfortable when using educational AI products.

我在使用教育 AI 产品时觉得适应/自在。

I believe teachers should actively learn to use AI technologies to support teaching.

我认为教师应该积极学习使用 AI 技术来帮助教学。

6. Applying AI

I can use educational AI products skillfully to support my daily teaching.

我能熟练使用教育 AI 产品来帮助日常教学。

I can learn new educational AI products relatively easily.

我能比较轻松地学习新的教育 AI 产品。

I can use educational AI products to enhance my work efficiency.

我能利用教育 AI 产品来提高工作效率。

I can support and guide students in using educational AI products effectively.

我能有效地指导学生使用教育 AI 产品。

I am able to integrate educational AI technologies into curriculum instruction.

我能够在课程教学中融入教育 AI 技术。

7. Evaluating AI Application

I can evaluate the functionality and effectiveness of an educational AI product after using it.

使用教育 AI 产品后，我能评估其功能和效果。

I can choose the most appropriate solution from various options offered by an educational AI product.

我能从教育 AI 产品提供的众多选项中选择最合适的方案。

I can select an appropriate educational AI product according to specific teaching tasks.

我能根据具体的教学任务选择合适的教育 AI 产品。

I can choose AI-based assessment products (eg. Grammarly) that match students' learning outcomes.

我能选择与学生学习成果相匹配的 AI 评估产品（比如语法检测工具 Grammarly）。

I can use educational AI products to provide students with feedback on their learning.

我能使用教育 AI 产品为学生提供学习反馈。

8. AI Ethics

I always follow ethical principles when using educational AI products.

使用教育 AI 产品时，我始终遵循伦理原则。

I am aware of privacy and information security issues when using educational AI products.

使用教育 AI 产品时，我清楚意识到隐私和信息安全问题。

I am aware of the misuse of educational AI.

我清楚意识到教育 AI 被误用的情况。

I always consider ethical and security issues when applying educational AI technologies.

应用教育 AI 技术时，我始终考虑伦理和安全问题。

I can identify ethical and moral violations during the application of educational AI in a timely manner.

使用教育 AI 时，我能及时识别违背伦理和道德的情况。

Part 4: School support for AI-related CPD activities

**学校对于** AI 相关的教师持续专业发展(CPD: continuous professional development)的支持

Strongly disagree Disagree Slightly disagree Slightly agree Agree Strongly agree

9. Competence support

My school provides effective, high-quality AI-related CPD activities so that I know how to integrate AI into my teaching .

我校提供有效、高质量的 AI 相关的 CPD 活动，所以我知道怎样将 AI 融入教学中。

My school provides sufficient AI-related CPD activities so that I have opportunities to learn to apply AI.

我校提供了充足的 AI 相关的 CPD 活动，所以我有机会学习使用 AI。

My school considers my workload, gives me room and time to do well in AI-related CPD activities.

我校会考虑我的工作负担，给予我空间和时间来有效参与 AI 相关的 CPD 活动。

The time table for AI-related CPD activities is reasonable in my school so that I can effectively engage in those activities.

我校安排的 AI 相关的 CPD 活动时间合理，所以我能有效参与其中。

There is good coordination in my school so that I can complete my task (e.g. participate in AI-related CPD activities, integrate AI into teaching) smoothly.

我校各方协调良好，所以我能顺利完成任务（如参与 AI 相关的 CPD 活动、将 AI 融入教学中）。

10. Autonomy support

I am involved in formulating the direction and contents of AI-related CPD activities.

我参与定制 AI 相关的 CPD 活动的方向和内容。

My school considers teachers' opinions or needs when arranging AI-related CPD activities.

在安排 AI 相关的 CPD 活动时，我校会考虑教师的意见或需求。

I participate voluntarily in AI-related CPD activities.

我是自愿参加 AI 相关的 CPD 活动的。

I have the freedom to choose specific AI-related CPD activities based on my professional needs.

根据自己的专业需要，我可以自由选择某些 AI 相关的 CPD 活动。

I feel that my opinions or needs are respected or addressed.

我感受到我的意见或需求得到了尊重或回应。

#### 11. Collegial support

I get encouragement from my colleagues, who are passionate about participating in AI-related CPD and integrating AI into teaching.

我的同事热衷于参与 AI 相关的 CPD 活动，并将 AI 融入教学，他们会鼓励我参加。

My colleagues share useful resources for AI-related CPD with me.

我的同事与我分享有用的 AI 相关的 CPD 活动资源。

My colleagues share their experiences with me regarding how to integrate AI into teaching.

我的同事与我分享他们在 AI 与教学融合方面的经验。

My colleagues care about the difficulties I face in learning and applying AI through AI-related CPD activities.

我的同事关心我在学习和应用 AI 过程中遇到的困难。

My colleagues and I collaborate to learn about and implement AI through AI-related CPD activities.

我与同事一起合作，在 AI 相关的 CPD 活动中学习并应用 AI。

#### Part 5: Motivation for AI-related CPD activities

##### AI 相关的 CPD 活动动机

Strongly disagree Disagree Slightly disagree Slightly agree Agree Strongly agree

#### 12. Amotivation - lacking the intention for CPD

I do not understand the purpose of participating in AI-related CPD activities.

我不明白参与 AI 相关的 CPD 活动的目的。

I do not see the relevance of participating in AI-related CPD activities.

我认为参与 AI 相关的 CPD 活动没有太大意义。

I do not know the reasons of participating in AI-related CPD activities.

我不知道为什么要参与 AI 相关的 CPD 活动。

#### 13. External regulation 外部调节

I participate in AI-related CPD activities because it is a duty, requirement, or policy set by my school.

我参加 AI 相关的 CPD 活动，是因为这是学校的职责、要求或政策。

I participate in AI-related CPD activities because my school would assess how well AI is integrated into my teaching.

我参加 AI 相关的 CPD 活动，是因为学校会评估我在教学中对 AI 的使用情况。

I participate in AI-related CPD activities because head of my group/grade/department may be upset if I don't.

我参加 AI 相关的 CPD 活动，是因为如果我不参加，我们教研组长/年级组长/部门领导会不高兴。

I participate in AI-related CPD activities to increase my chances of promotion or financial benefits.

我参加 AI 相关的 CPD 活动，是因为我想晋升或获得经济奖励。

I participate in AI-related CPD activities to keep up with my peers.

我参加 AI 相关的 CPD 活动，是因为我不想落后于我的同事们。

#### 14. Introjected regulation 内摄调节

I participate in AI-related CPD activities because I would feel embarrassed to explain to others my absence.

我参加 AI 相关的 CPD 活动，是因为不想向别人解释为什么我没有参加。

I participate because I could demonstrate to others my willingness to accept new things.

我参加 AI 相关的 CPD 活动，是因为我可以向他人展示我愿意接纳新事物。

I participate because I would feel uncomfortable if I refused to get involved.

如果不参与 AI 相关的 CPD 活动，我会感到不安。

I participate because I would feel bad if I cannot strive for good teaching performance (through these AI-related CPD activities).

我参加 AI 相关的 CPD 活动，是因为如果我不能(通过参加这些活动)努力提升教学表现，我会感到不安。

I participate because I don't want others to think that I am incapable of doing it.

我参加 AI 相关的 CPD 活动，是因为我不想让别人觉得我没能力做这些事。

#### 15. Identified regulation **认同调节**

I participate in AI-related CPD activities because they involve important contents that I should learn.

我参加 AI 相关的 CPD 活动，是因为其内容对我而言很重要，我应该学习。

I participate in AI-related CPD activities because I believe AI is an important tool that can support my teaching.

我参加 AI 相关的 CPD 活动，是因为我相信 AI 是帮助教学的重要工具，因此我参加相关培训。

I participate in AI-related CPD activities because I believe students can also benefit if I master AI-related knowledge.

我参加 AI 相关的 CPD 活动，是因为我觉得如果我掌握 AI 相关知识，学生也能从中受益。

I participate in AI-related CPD activities because I believe mastering AI-related knowledge enhances my teaching quality.

我参加 AI 相关的 CPD 活动，是因为我相信掌握 AI 知识可以提升教学质量。

I participate in AI-related CPD activities because these activities are meaningful and worthwhile to be promoted.

我参加这些培训，是因为这些活动有意义且值得推广。

#### 16. Intrinsic motivation **内在动机**

I participate in AI-related CPD activities because I'm interested in learning about and integrating AI into teaching.

我参加 AI 相关的 CPD 活动，是因为我对学习和在教学中融合 AI 很感兴趣。

I participate in AI-related CPD activities to satisfy my inquiring mind.

我参加这些活动，是因为我想满足自己的求知欲。

I participate in AI-related CPD activities to realize my self-worth.

我参加这些活动，是因为我想实现自我价值。

I participate in AI-related CPD activities because I feel satisfied when overcoming the obstacles in the learning process.

我参加 AI 相关的 CPD 活动，是因为我享受克服学习中的困难的过程。

I participate in AI-related CPD activities because I find it enjoyable to learn new things like AI.

我参加 AI 相关的 CPD 活动，是因为我觉得学习像 AI 这样的新事物很有趣。

#### Part 6: Challenges and perceived differences

What factors do you think impede you to pursue AI-related CPD? Please choose up to Five from the list below.

哪些因素阻碍了您参与 AI 相关教师培训 (CPD)？请从以下选项中选择最多 5 项。

heavy workload

工作量大

lack of financial support

缺乏经济支持  
lack of school policy support  
缺乏学校政策支持  
Inconvenient timing (e.g. on weekdays or too long)  
时间不合适（如安排在工作日或者培训时间过长）  
Inconvenient location (e.g. too far away)  
地点不方便（如距离太远）  
limited opportunities  
机会有限  
low quality of AI-related CPD activities  
活动质量不高  
ineffective designs of AI-related CPD activities  
活动设计不合理  
limited forms of AI-related CPD activities (e.g. only lectures)  
活动形式单一（如仅为讲座）  
Irrelevant contents to teaching needs  
活动内容与教学需求不相关  
lack of interest in AI-related CPD activities  
对这些活动缺乏兴趣  
feeling unnecessary to participate in AI-related CPD activities  
觉得没必要参加这些活动  
personal circumstances (e.g. health issues, pregnancy)  
个人原因（如健康问题、怀孕等）  
others  
其他

Do you think EFL teachers in public and private schools differ regarding their overall levels of AI literacy?

您认为公立和民办学校的英语教师在 AI 素养方面整体水平有差异吗？

Yes, significantly 是的，差异很大。

Yes, slightly 是的，有些差异。

No, almost the same. 没有，基本相同。（Skip to Question 3）

If YES, in which type of schools do you think teachers generally have higher levels of AI literacy?

**如果您认为有差异，哪类学校的教师 AI 素养水平更高？**

public schools 公立学校

private schools 私立学校

Do you think EFL teachers in public and private schools receive different levels of school support for AI-related CPD?

您认为公立和民办学校的英语教师在参加 AI 相关的 CPD 活动方面，学校给予的支持是否有差异？

Yes, significantly 是的，差异很大。

Yes, slightly 是的，有些差异。

No, almost the same. 没有，基本相同。（Skip to Question 4）

If YES, in which type of schools do you think teachers receive more school support for AI-related CPD?

如果您认为有差异，哪类学校的教师获得更多学校支持？

public schools 公立学校

private schools 私立学校

Do you think EFL teachers in public and private schools differ in terms of their motivation to participate in AI-related CPD?

您认为公立和民办学校的英语教师在参与 AI 培训的动机水平上，是否存在差异？

Yes, significantly 是的，差异很大。

Yes, slightly 是的，有些差异。

No, almost the same. 没有，基本相同。(Skip to Question 3)

If YES, in which type of schools do you think teachers are generally more motivated?

如果您认为有差异，哪类学校的教师的参与动机更强？

public schools 公立学校

private schools 私立学校

To what extent do you think each of the following should be responsible for improving teachers' AI literacy?

您认为以下各方在提升教师 AI 素养方面应承担多少责任？请按责任大小依次排序（从大到小）。

government and educational authorities

政府及教育主管部门

school leadership (e.g. principals, heads of department, school owners)

学校领导层（如校长、教研组长、校方）

teachers themselves

教师自身

To what extent do you think each of the following should be responsible for motivating teachers for AI-related CPD activities?

您认为以下各方在激励教师参与 AI 相关的 CPD 活动方面应承担多少责任？请按责任大小依次排序（从大到小）。

government and educational authorities

政府及教育主管部门

school leadership (e.g. principals, heads of department, school owners)

学校领导层（如校长、教研组长、校方）

teachers themselves

教师自身

Could you please share 1-3 suggestions on how to enhance teachers' AI literacy and motivation to participate in AI-related CPD? (You may repondse in English or Chinese.)

请您分享 1-3 条关于如何提升教师 AI 素养和参与 AI 相关 CPD 活动动机的建议。

## Part 7: Demographic Information

1. Your birth sex

您的出生性别是？

Male 男

Female 女

2. Highest educational qualification

最高学历

Below Bachelor's degree 学士以下

Bachelor's degree 学士

Master's degree 硕士

Above master's degree 硕士以上

3. Years of working

工作年限

1-3years 1-3 年

4-10 years 4-10 年

over 10 years 10 年以上

4. Age

年龄

Under 25 25 岁以下

25-34

35-44

45-54

55+

5. Your educational stage

所教学段

Junior high school

初中

Senior high school

高中

6. School type

学校类型

Public school

公立学校

Private school (Gaokao-oriented)

私立学校 ( 高考方向 )

Private school (International)

私立学校 ( 国际方向 )

7. School name

学校名称

8. Current professional role

目前担任职位

English teacher

英语老师

English teacher+ one administrative role (e.g. principal, head of department/ grade; head teacher)

英语老师+一个管理职位 ( 如校长、部门主管、年级组长、班主任等 )

English teacher+ 2 or more administrative roles

英语老师+两个或更多管理职位

English teacher+ other role(s) not mentioned

英语老师+其他职位

Thank you very much for taking this survey!

Please feel free to send this survey on to anyone who meet the inclusion criteria and might be interested. You can copy and paste this link [ ], which will take them straight to the survey.

If you have any comments, suggestions or questions, please feel free to contact \*\*\*

非常感谢您参与本次问卷调查！

欢迎您将此问卷转发给符合参与条件并可能感兴趣的同事或朋友。您可以分享这个链接 [ ] , 他们点击后即可直接进入问卷填写页面。

如果您有任何意见、建议或疑问，欢迎随时联系\*\*\*，邮箱地址为：\*\*\*。

### Appendix 3: Semi-Structured Interview Questions/Guide

The semi-structured interview will be conducted in Chinese, the participants' native language. The interview questions are provided below in Chinese, followed by an English translation for reference.

#### Draft Interview Questions

请您简单介绍一下您自己（工作年限，职位等）及所在的学校（名称，地域，学校类型，地位等）

Could you please briefly introduce yourself (e.g., years of working, positions) and your school? (e.g., name, location, public/private school, status)

#### 人工智能素养 AI Literacy

1. 您觉得什么是人工智能素养（AI literacy），它应该包含哪些方面的能力？（有关注意到使用伦理相关的内容吗？）

In your opinion, what is AI literacy? What competencies should it include? (Have you considered issues like ethics related to AI application?)

2. 您觉得人工智能素养重要吗？老师们有必要提升这方面能力吗？

Do you think AI literacy is important? Is it necessary for teachers to improve their AI-related skills?

3. 您觉得您整体的人工智能素养如何？哪些方面的能力表现优秀，哪些方面比较欠缺？

How would you assess your own AI literacy? In which areas do you perform well, and in which areas do you feel you lack competence?

4. 您愿意继续提升自己的人工智能素养吗？您是如何提升自己人工智能素养的？

Are you willing to further enhance your AI literacy? How do you usually develop your AI-related competencies?

5. 您觉得您身边的同事老师们的人工素养如何？

How would you assess the overall AI literacy of your colleagues?

6. 您觉得您身边的同事老师们愿意提升自己的 AI 素养吗？据您观察，他们是如何提升自身人工素养的？

Do you think your colleagues are willing to improve their AI literacy? Based on your observations, how do they usually work on developing their AI-related competencies?

7. 您觉得 AI 相关的持续专业发展活动有必要吗？（为什么？如何提升？）

Do you think AI-related continuing professional development (CPD) activities are necessary? (Why? How?)

8. 您觉得公立、私立学校英语老师的 AI 素养有差异吗？有什么样的差异？为什么会有这样的差异？谁应该为这种差异负责呢？

To what extent do you think levels of AI literacy differ for teachers in public and private schools? What are the reasons for these differences if there are some? (What? Why? Who should be responsible for these differences/ improving teachers' AI literacy?)

#### 学校对于人工智能相关的专业发展的支持 School support for AI-related CPD activities

9. 您觉得您所在的学校支持/鼓励老师们参加 AI 相关的持续专业发展的活动吗？学校可以提供哪些支持呢？这些支持充足吗？

Does your school encourages teachers to participate in AI-related CPD activities? What kind of support does your school provide? Do you think the support is sufficient?

10. 您所在的学校都提供哪些 AI 相关的 CPD 活动呢？您有足够的机会参与这些活动吗？您对它们的数量、质量满意吗？你觉得这些促进教师持续专业发展的活动有没有满足老师们的专业发展需要呢？为什么呢？

What kinds of AI-related CPD activities does your school typically offer to support teachers' professional development? Do you have sufficient opportunities to participate in these activities? Are you satisfied with their quantity and quality? Do you think these activities meet teachers' professional development needs? Why or why not?

11. 您觉得公立和私立学校在 AI 相关的 CPD 方面给老师们提供的支持有差异吗？有怎样的差异呢？为什么会有这样的差异？

To what extent do you think the opportunities for teachers in public and private schools to participate in AI-related CPD activities differ? What are the reasons for these differences if there are some?

12. 你认为谁应该为这样的差异负责？政府、学校、老师应该怎样对待、处理这些差异呢？

Who do you think should be responsible for these differences? How should the government, schools, and teachers address or manage these disparities?

### **参加人工智能相关职业发展的动机**

13. 你觉得老师们参与 AI 相关的持续职业发展活动的动机强吗？都有哪些因素激励老师们参加这些活动呢？最主要的动机又是什么呢？（更多受内在还是外在动机驱动呢？）

What do you think motivates teachers to engage in AI-related CPD activities? What is the primary motivation? Are they driven more by intrinsic or extrinsic factors?

14. 你觉得哪些因素阻碍老师们参加 AI 相关的持续职业发展呢？最主要的因素又是什么呢？

What factors prevent teachers from participating in AI-related CPD activities? What do you think is the biggest barrier?

15. 你觉得公立和私立学校的老师们参与 AI 相关的职业发展活动的机会和动机水平存在怎样的差异？（哪类学校的老师机会多一些、动机水平要高一些呢？）是什么导致了这种差异呢？/ 谁应该对这种差异负责呢？

To what extent do you think public and private school teachers may differ in terms of opportunities and motivation levels for participating in AI-related CPD activities? (Which group has more opportunities? Which group tends to be more motivated?) What do you think causes this difference? Who should be responsible for addressing it?

16. 你觉得怎样才能更好的激励老师们去追求 AI 相关的持续专业发展呢？

In your opinion, what can be done to better motivate teachers to engage in AI-related CPD activities?

## Appendix 4: CUREC Approval

Applicant: Li Wang

Principal Investigator: Elizabeth Wonnacott

Department: Education

Study title: Chinese EFL Teachers' AI Literacy and Motivation for AI-Related CPD Activities:  
A Comparison Between Public and Private Schools  
(Version: 1.0)

Ethics reference: Education (Educ) DREC - 1388905

Dear Elizabeth Wonnacott,

On behalf of the Committee, I confirm that the above research study described in the application and other supporting documentation submitted to the committee has been carefully considered on behalf of the Education (Educ) DREC in accordance with the University's regulations and policy for ethics approval of research involving human participants, human tissue and/or personal data. The opinion is as follows:

Opinion of Research Ethics Committee: Favourable Opinion

Subject to the following conditions:

Decision Date: 6 May 2025, 10:26

Opinion End Date: 6 Nov 2026

If favourable, insurance-provided indemnity arrangements will be in place between the decision date and opinion end date and you may now commence your study activities. Should you plan to continue the research beyond the end date above, it is your responsibility to ensure that you request, and receive, an extension (via amendment) from the committee for indemnity to remain in place. You may be required to provide a justification.

Please note the following:

Amendments: Should there be any subsequent changes to the reviewed study, applications for amendments can be made via the Oxford Ethics Application System (Worktribe Ethics).

Reports: Studies considered by OxTREC are expected to submit an *annual progress report* on each anniversary of study approval, until the study is completed. An end of study report is also required.

Audit: This study may be selected for audit at the discretion of the Research Governance, Ethics and Assurance Team.

Data safety: It is the responsibility of the PI to ensure that all data collected during the course of the study is stored and transferred safely and securely in accordance with University requirements. Further guidance and advice are available from the Research Data Team. Additional information is available at <https://researchsupport.web.ox.ac.uk/governance/ethics>

Yours Sincerely

Education Ethics Officer

## **Appendix 5: Participant Information Sheet**

### **Chinese EFL Teachers' AI Literacy and Motivation for AI-Related CPD Activities: A Comparison Between Public and Private Schools**

#### **PARTICIPANT INFORMATION SHEET**

Central University Research Ethics Committee Approval Reference: [EDUC\_1388905]

#### **Introductory paragraph**

You are being invited to take part in a research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part.

#### **Why is this research being conducted?**

The rapid emergence and increasingly widespread adoption of artificial intelligence (AI) across various fields have made it essential for individuals to develop the ability to understand and utilize AI effectively and properly. AI literacy, a newly emerging concept, involves four key dimensions: a) Knowing and Understanding AI (KUAI); b) Applying AI (AAI); c) Evaluating AI Application (EAIA); d) AI Ethics (AIE) (Ng et al., 2021). In the field of education, teachers play a critical role in guiding students to use AI responsively and effectively, which requires them to be equipped with a high level of AI literacy.

This study aims to investigate Chinese EFL (English as a Foreign Language) teachers' AI literacy levels and their motivation to engage in AI-related Continuing Professional Development (CPD) activities, comparing teachers from public and private schools regarding these aspects. The findings of the research may offer insights into how to improve EFL teachers' AI literacy and provide recommendations for designing more effective AI-related CPD activities.

#### **Why have I been invited to take part?**

You have been invited to participate as you are English teachers in secondary schools, whether public or private schools, in four Tier-1 cities in China, including Beijing, Shanghai, Guangzhou, and Shenzhen. You have completed the questionnaire and showed interest in the follow-up interview. Approximately 20 interviews will be conducted.

#### **Do I have to take part?**

No. It is up to you to decide whether to take part. You can withdraw yourself from the research, without giving a reason, by advising me of this decision. If you complete the interview but would like to withdraw the data you have contributed, you should email the researcher within two weeks of the interview. After data anonymization (e.g. removal of voice identifier, pseudonym replacement) and data analysis, data withdrawal will no longer be possible.

What will happen to me if I take part in the research?

*The interview will be conducted and recorded online via Microsoft Teams.*

*To facilitate a more engaging and interactive discussion, I kindly request that you enable your camera during the session. However, if you are uncomfortable with video recording, you may choose to turn off your camera and participate via audio only.*

*You will receive the consent form via email, and I kindly request that you return it as soon as possible before we conduct the interview.*

*With your consent, I would like to video record and transcribe the interview to ensure an accurate and comprehensive record of our conversation for future analysis. As soon as the transcription has been checked, we will delete the video and audio, and only the transcript will be retained. Any personal information (e.g. your name, years of working, and school name) will be redacted from the transcripts.*

*The interview lasts for approximately 30 minutes, and you only need to participate in the interview once.*

*You will be asked open-ended questions about your understanding of AI literacy, experiences about AI-related activities, and attitudes towards those activities.*

*You can ask to pause or stop the interview at any time.*

### **What are the possible disadvantages and risks in taking part?**

*I sincerely appreciate your time and effort in participating in this research. My goal is to make the interview engaging, comfortable, and respectful of your perspectives. If at any point you feel uncomfortable or prefer not to answer certain questions, please let me know, and we can adjust or skip those questions. Additionally, I would like to assure you that all data collected will be anonymized during analysis and in any research outputs (e.g., the dissertation). No personally identifiable information will be included, and your participation will remain confidential.*

Are there any benefits in taking part?

While there are no immediate benefits for participants participating in the research, it is hoped that this research will lead to a better understanding of EFL teachers' AI literacy and motivation towards AI-related CPD activities, which may provide insights in the provision of AI-related CPD.

What information will be collected and why is the collection of this information relevant for achieving the research objectives?

*We will collect information relevant to answering our research questions which will include years of working and school type/name. The name of the school and any personal information will be redacted from the interview transcripts and not included in any publications. The interview will explore key topics including your understanding of AI literacy, exposure to AI-related CPD activities, perceptions of the effectiveness, motivation for those activities, and challenges in participating relevant CPD activities. The interview is expected to last approximately 30 minutes.*

*The interview will be recorded on Microsoft Teams, including video and audio. After the interview has been transcribed the original video and audio will be deleted. In the transcription, we will replace your name and the name of the school with pseudonyms. During the study we keep a linkage file which links you to your pseudonym, but this will be deleted at the end of the study. All of your data will be stored in a password-protected electronic file on University of Oxford secure servers. The findings will be used in the researcher's MSc dissertation and possibly written up for publication or presented at academic conferences. You will not be identifiable.*

The researcher *and the supervisor* will have access to the research data.

Identifiable data (including consent forms) will be stored in a password-protected electronic file on University of Oxford secure servers for 3 years after the submission of the dissertation.

Will the research be published? Could I be identified from any publications or other research outputs?

The findings from the research will be written up *in a dissertation, and the participants are not identifiable from the data and the research outputs.*

A copy of my dissertation will be deposited online in the [Oxford University Research Archive](#) where it will be publicly available to facilitate its use in future research. The research may also later be written up for a publication in an academic journal and presented at research conferences.

#### Data Protection

The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the research. The University will process your personal data for the purpose of the research outlined above. Research is a task that is performed in the public interest. Further information about your rights with respect to your personal data is available from the University's Information Compliance website at <https://compliance.admin.ox.ac.uk/individual-rights>.

Who has reviewed this research?

This research has received ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee. (Ethics reference: EDUC\_1388905).

Who do I contact if I have a concern about the research or I wish to complain?

If you have a concern about any aspect of this research, please contact Li Wang via [li.wang@kellogg.ox.ac.uk](mailto:li.wang@kellogg.ox.ac.uk) or Elizabeth Wonnacott via [elizabeth.wonnacott@education.ox.ac.uk](mailto:elizabeth.wonnacott@education.ox.ac.uk), and we will do our best to answer your query. We will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the University of Oxford Research Governance, Ethics & Assurance (RGEA) team at [rgea.complaints@admin.ox.ac.uk](mailto:rgea.complaints@admin.ox.ac.uk) or on +44 (0)1865 616480.

Further Information and Contact Details

If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

Li Wang

Department of Education

University of Oxford

15 Norham Gardens, Oxford OX2 6PY

University email: [li.wang@kellogg.ox.ac.uk](mailto:li.wang@kellogg.ox.ac.uk)

University tel: +44 (0) 7561 540374

**Appendix 6: Consent Forms**

**Consent to take part in**

**Chinese EFL Teachers' AI Literacy and Motivation for AI-Related CPD Activities: A Comparison Between Public and Private Schools**

Central University Research Ethics Committee (CUREC) approval reference:  
EDUC\_1388905

Purpose of Study: This research is to investigate Chinese EFL (English as a Foreign Language) teachers' AI literacy levels and their motivation to engage in AI-related Continuing Professional Development (CPD) activities, comparing teachers from public and private schools regarding these aspects.

**Please initial  
each box if you  
agree with the  
statement**

I confirm that I have read and understand the information sheet for the above research. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

I understand that my participation is voluntary and that I am free to withdraw at any point within two weeks of the interview, **until**                     <sup>1</sup>, without giving any reason.

I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.

I understand that I will not be identifiable from any publications.

I consent to being audio and video recorded.

---

<sup>1</sup> The exact date will be updated once the interview is scheduled with the interviewee.

I understand how audio recordings and videos will be used in research outputs.

Use of quotations: Please indicate your preference (select *one* option):

a) I agree to the use of quotations in research outputs if I am not identifiable. **or**

b) I agree to the use of direct quotations, attributed to my name, in research outputs. **or**

c) I do not wish to be quoted.

I give permission for you to contact me again to clarify information.

I understand how to raise a concern or make a complaint.

I agree to take part and thereby assign to the researcher all copyright in my contribution for use in all work stemming from this project and future projects.

I agree that my personal contact details can be retained in a secure database so that the researchers can contact me about future studies.

YES /  
NO

\_\_\_\_\_

Name of participant

dd / mm / yyyy

Date

\_\_\_\_\_

Signature

\_\_\_\_\_

Name of person taking  
consent

dd / mm / yyyy

Date

\_\_\_\_\_

Signature

## Appendix 7: Questionnaire Coding Scheme

| Variable name   | Label/Question Text                                         | Response Type | Value Labels/Coding                                                                                                    |
|-----------------|-------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------|
| KUAI_1-5        | 5 items assessing teachers' knowing and understanding of AI | Likert (1-5)  | 1-5=strongly disagree 非常不同意, disagree 不同意, neutral 中立, disagree 不同意, strongly agree 非常同意                               |
| AAI_1-5         | 5 items assessing teachers' application of AI               | Likert (1-5)  | 1-5=strongly disagree 非常不同意, disagree 不同意, neutral 中立, disagree 不同意, strongly agree 非常同意                               |
| EAI_1-5         | 5 items assessing teachers' evaluation of AI application    | Likert (1-5)  | 1-5=strongly disagree 非常不同意, disagree 不同意, neutral 中立, disagree 不同意, strongly agree 非常同意                               |
| AI_1-5          | 5 items assessing teachers' AI ethics                       | Likert (1-5)  | 1-5=strongly disagree 非常不同意, disagree 不同意, neutral 中立, disagree 不同意, strongly agree 非常同意                               |
|                 |                                                             |               |                                                                                                                        |
| competence_1-5  | 5 items assessing competence support teachers have received | Likert (1-6)  | 1-6=strongly disagree 非常不同意, disagree 不同意, slightly disagree 有点不同意, slightly agree 有点同意, agree 同意, strongly agree 非常同意 |
| autonomy_1-5    | 5 items assessing autonomy support teachers have received   | Likert (1-6)  | 1-6=strongly disagree 非常不同意, disagree 不同意, slightly disagree 有点不同意, slightly agree 有点同意, agree 同意, strongly agree 非常同意 |
| collegial_1-5   | 5 items assessing collegial support teachers have received  | Likert (1-6)  | 1-6=strongly disagree 非常不同意, disagree 不同意, slightly disagree 有点不同意, slightly agree 有点同意, agree 同意, strongly agree 非常同意 |
|                 |                                                             |               |                                                                                                                        |
| amotivation_1-3 | 3 items assessing teachers' amotivation                     | Likert (1-6)  | 1-6=strongly disagree 非常不同意, disagree 不同意, slightly disagree 有点不同意, slightly agree 有点同意, agree 同意, strongly agree 非常同意 |
| external_1-5    | 5 items assessing teachers' external regulation             | Likert (1-6)  | 1-6=strongly disagree 非常不同意, disagree 不同意, slightly disagree 有点不同意, slightly agree 有点同意, agree                         |

|                       |                                                    |                  |                                                                                                                        |
|-----------------------|----------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------|
|                       |                                                    |                  | 同意, strongly agree 非常同意                                                                                                |
| introjected_1-5       | 5 items assessing teachers' introjected regulation | Likert (1-6)     | 1-6=strongly disagree 非常不同意, disagree 不同意, slightly disagree 有点不同意, slightly agree 有点同意, agree 同意, strongly agree 非常同意 |
| identified_1-5        | 5 items assessing teachers' identified regulation  | Likert (1-6)     | 1-6=strongly disagree 非常不同意, disagree 不同意, slightly disagree 有点不同意, slightly agree 有点同意, agree 同意, strongly agree 非常同意 |
| intrinsic_1-5         | 5 items assessing teachers' intrinsic motivation   | Likert (1-6)     | 1-6=strongly disagree 非常不同意, disagree 不同意, slightly disagree 有点不同意, slightly agree 有点同意, agree 同意, strongly agree 非常同意 |
|                       |                                                    |                  |                                                                                                                        |
| impeding_factors      |                                                    | multiple choices | 1= the choice is chosen; 0= the choice is not chosen                                                                   |
|                       |                                                    |                  |                                                                                                                        |
| literacy_difference   |                                                    | multiple choices | 1-3=Yes, significantly 是的, 差异很大, Yes, slightly 是的, 有些差异, No, almost the same 没有, 基本相同                                  |
| higher_literacy       |                                                    | multiple choices | 1-2=public schools 公立学校, private schools 私立学校                                                                          |
| support_difference    |                                                    | multiple choices | 1-3=Yes, significantly 是的, 差异很大, Yes, slightly 是的, 有些差异, No, almost the same 没有, 基本相同                                  |
| more_support          |                                                    | multiple choices | 1-2=public schools 公立学校, private schools 私立学校                                                                          |
| motivation_difference |                                                    | multiple choices | 1-3=Yes, significantly 是的, 差异很大, Yes, slightly 是的, 有些差异, No, almost the same 没有, 基本相同                                  |
| higher_motivation     |                                                    | multiple choices | 1-2=public schools 公立学校, private schools 私立学校                                                                          |

|                           |  |                  |                                                                                                                                                                                                   |
|---------------------------|--|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           |  |                  |                                                                                                                                                                                                   |
| literacy_responsibility   |  | ranking          | 1-3=rank 1st,2nd,3rd                                                                                                                                                                              |
| motivation_responsibility |  | ranking          | 1-3=rank 1st,2nd,3rd                                                                                                                                                                              |
|                           |  |                  |                                                                                                                                                                                                   |
| gender                    |  | multiple choices | 1-2=male 男, female 女                                                                                                                                                                              |
| education                 |  | multiple choices | 1-4=below bachelor's degree, bachelor's degree, master's degree, above master's degree                                                                                                            |
| years_of_working          |  | multiple choices | 1-3=1-3years, 4-10years, over 10years                                                                                                                                                             |
| age_range                 |  | multiple choices | 1-5=under 25, 25-34, 35-44, 45-54, 55+                                                                                                                                                            |
| educational_stage         |  | multiple choices | 1-2= junior high school 初中, senior high school 高中                                                                                                                                                 |
| school_type               |  | multiple choices | 1-3=public schools 公立学校, private schools(gaokao-oriented)私立学校 ( 高考方向), private schools (international)私立学校 ( 国际学校 )                                                                               |
| school_location           |  | multiple choices | 1-4=beijing 北京, shanghai 上海, guangzhou 广州, shenzhen 深圳                                                                                                                                            |
| positions                 |  | multiple choices | 1-4=english teacher 英语老师, english teacher+one administrative role 英语老师+一个管理职位, english teacher+2 or more administrative roles 英语老师+两个或更多管理职位, english teacher+other roles not mentioned 英语老师+其他职位 |

### Appendix 8: Test for Instrument Reliability: Cronbach's Alpha

| Dimension      | Raw_Alpha | Std_Alpha | Avg_R |
|----------------|-----------|-----------|-------|
| AI_literacy    | 0.91      | 0.908     | 0.33  |
| KUALI          | 0.623     | 0.618     | 0.245 |
| AAI            | 0.793     | 0.797     | 0.44  |
| EALIA          | 0.801     | 0.798     | 0.442 |
| ALIE           | 0.911     | 0.912     | 0.674 |
| School_support | 0.948     | 0.948     | 0.547 |
| competence     | 0.924     | 0.924     | 0.71  |
| autonomy       | 0.889     | 0.889     | 0.616 |
| collegial      | 0.91      | 0.91      | 0.668 |
| Motivation     | 0.822     | 0.84      | 0.186 |
| amotivation    | 0.849     | 0.85      | 0.653 |
| external       | 0.728     | 0.723     | 0.343 |
| introjected    | 0.765     | 0.771     | 0.402 |
| identified     | 0.859     | 0.861     | 0.553 |
| intrinsic      | 0.855     | 0.858     | 0.548 |

### Appendix 9: Normality Tests for Wilcoxon Rank-Sum Test

| Variable    | Group   | N  | Skewness | Kurtosis | Shapiro_p | Normality |
|-------------|---------|----|----------|----------|-----------|-----------|
| AI Literacy | Public  | 68 | -1.345   | 1.998    | 0         | No        |
| KUAI        | Public  | 68 | -1.731   | 4.698    | 0         | No        |
| AAI         | Public  | 68 | -1.365   | 1.86     | 0         | No        |
| EAI         | Public  | 68 | -1.309   | 1.048    | 0         | No        |
| AI          | Public  | 68 | -1.223   | 0.074    | 0         | No        |
| AI Literacy | Private | 65 | -0.133   | -0.291   | 0.0229    | No        |
| KUAI        | Private | 65 | -0.353   | 0.502    | 0.036     | No        |
| AAI         | Private | 65 | -0.694   | 1.691    | 0.0021    | No        |
| EAI         | Private | 65 | -0.066   | -0.41    | 0.0227    | No        |
| AI          | Private | 65 | -0.724   | 0.051    | 0.0045    | No        |

| Variable       | Group   | N  | Skewness | Kurtosis | Shapiro_p | Normality |
|----------------|---------|----|----------|----------|-----------|-----------|
| School Support | Public  | 68 | -1.111   | 0.239    | 0         | No        |
| competence     | Public  | 68 | -0.866   | -0.649   | 0         | No        |
| autonomy       | Public  | 68 | -0.921   | -0.227   | 0         | No        |
| collegial      | Public  | 68 | -1.579   | 1.758    | 0         | No        |
| School Support | Private | 65 | -0.526   | -0.625   | 0.0085    | No        |
| competence     | Private | 65 | -0.413   | -0.637   | 0.0326    | No        |
| autonomy       | Private | 65 | -0.931   | 0.272    | 0.0003    | No        |
| collegial      | Private | 65 | -0.945   | 0.49     | 0.0005    | No        |

| Variable   | Group  | N  | Skewness | Kurtosis | Shapiro_p | Normality |
|------------|--------|----|----------|----------|-----------|-----------|
| Motivation | Public | 68 | -1.481   | 2.004    | 0         | No        |

|                            |         |    |        |        |        |     |
|----------------------------|---------|----|--------|--------|--------|-----|
| Autonom ous<br>M otivation | Public  | 68 | -2.296 | 6.388  | 0      | No  |
| External<br>M otivation    | Public  | 68 | -1.062 | 0.177  | 0      | No  |
| am otivation               | Public  | 68 | 1.189  | 1.132  | 0      | No  |
| external                   | Public  | 68 | -0.841 | 0.039  | 0.0002 | No  |
| introjected                | Public  | 68 | -1.206 | 0.948  | 0      | No  |
| identified                 | Public  | 68 | -2.372 | 7.12   | 0      | No  |
| intrinsic                  | Public  | 68 | -1.974 | 4.546  | 0      | No  |
| M otivation                | Private | 65 | -0.321 | 0.343  | 0.384  | Yes |
| Autonom ous<br>M otivation | Private | 65 | -1.02  | 1.301  | 0.0001 | No  |
| External<br>M otivation    | Private | 65 | 0.232  | 0.249  | 0.7818 | Yes |
| am otivation               | Private | 65 | 0.932  | 0.328  | 0      | No  |
| external                   | Private | 65 | 0.401  | -0.239 | 0.2516 | Yes |
| introjected                | Private | 65 | -0.163 | -0.453 | 0.5105 | Yes |
| identified                 | Private | 65 | -1.33  | 2.957  | 0      | No  |
| intrinsic                  | Private | 65 | -0.906 | 0.571  | 0.0001 | No  |

### Appendix 10: Normality Tests for Spearman's Correlation

| Name                        | N   | Skewness | Kurtosis | Shapiro_p | Normality |
|-----------------------------|-----|----------|----------|-----------|-----------|
| AILiteracy                  | 133 | -1.063   | 2.089    | 0         | No        |
| School Support              | 133 | -0.841   | -0.174   | 0         | No        |
| competence (School Support) | 133 | -0.628   | -0.741   | 0         | No        |
| autonomy (School Support)   | 133 | -0.959   | 0.089    | 0         | No        |
| collegial (School Support)  | 133 | -1.22    | 0.913    | 0         | No        |
| Motivation                  | 133 | -0.435   | -0.208   | 0.031     | No        |
| Autonomous Motivation       | 133 | -1.641   | 3.65     | 0         | No        |
| External Motivation         | 133 | -0.157   | -0.634   | 0.025     | No        |

## Appendix 11: Codebook for the Open-Ended Survey Question

| 主题       | 子主题         | 编码      | 描述           | 引文                                                                                         |
|----------|-------------|---------|--------------|--------------------------------------------------------------------------------------------|
| 提升 AI 素养 | 更多实操性强的活动   | AI 实操培训 | 跟实际教学相关的培训活动 | 多多开展 AI 培训，让 AI 与教学结合，开展贴合教学场景的 AI 实践培训，让教师快速掌握实用技能                                        |
|          |             |         |              | 基于教师教学实际，开展 AI 工具实操培训，展示 AI 如何解决教学痛点                                                       |
|          |             | 实践机会    | 在教学实践中应用 AI  | 打造“AI 教学工作坊”，定期组织教师用 AI 工具打磨英语课例，如借助 AI 生成个性化阅读材料，在实践中提升应用能力。                              |
|          |             |         |              | 打造“AI+ 英语教学”实践基地，教师在基地可沉浸式用 AI 设计情景对话课堂、开发智能听力训练，通过真实教学场景应用，强化 AI 素养                       |
|          | 丰富活动形式与内容   | 多样化培训形式 | 不同的培训形式      | 也可结合线上线下方式，完成相关的学习活动                                                                       |
|          |             |         |              | 设立跨校 AI 教学协作项目，不同学校英语教师组队，借助 AI 开展联合教研、跨校学生 AI 英语互动活动                                      |
|          |             | 针对性内容   | 跟教学内容相关      | 组织“AI 教学工作坊”，邀请技术团队与英语骨干教师合作，针对词汇、阅读等教学场景，手把手教教师用 AI 设计互动课程。                               |
|          | 提供满足老师需求的活动 | 倾听意见    | 尊重教师意见和想法    | AI 相关 CPD 活动应该多听取老师对于活动的想法、意见、形式。而不是学校领导层单独决定。                                             |
|          |             | 满足教学需求  | 教学需求为导向      | 构建分层培训体系，针对 AI 基础薄弱教师开展入门实操课，如 AI 辅助英语作文批改工具使用；为有基础教师开设进阶班，探索 AI 生成个性化英语学习路径，满足不同需求提升参与动力。 |
|          |             |         |              | 分析不同学段不同学科老师需要用的 ai 技术，怎么与学科课堂融合，进行针对性实操                                                   |

|      |         |          |               |                                                                                          |
|------|---------|----------|---------------|------------------------------------------------------------------------------------------|
|      | 硬件、技术支持 | 更新资源/设备  | AI 设备、资源相关    | 学校花资金引进先进的 AI 技术，AI 设备。让老师能快速上手，设备或技术能流畅使用。                                              |
|      |         |          |               | 搭建区域 AI 教学资源库，汇聚适配英语学科的 AI 工具（像智能作文批改、口语测评 AI）、优质案例，方便教师随时学用。                            |
|      |         | 技术支持     | AI 使用技术层面支持   | 学校需要多多提供培训，费用，技术和人员支持                                                                    |
|      |         |          |               | 缺少对学生设备监管的有效途径                                                                           |
| 提升动机 | 增强外部激励  | 政策、荣誉、奖励 | 涉及政策荣誉奖励等     | 把提升 AI 素养纳入教师绩效考核，与职称评定、评优挂钩，给予优秀师物质奖励和更多的职业发展机会                                         |
|      |         | 竞赛机制     | 用比赛竞赛的方式激励老师  | 开展跨校 AI 教学交流赛，以赛促学，增强教师提升 AI 素养、参与 CPD 活动的动力                                             |
|      |         | 同伴激励     | 涉及同事互助、激励等    | 让掌握 AI 技能的教师与其他教师结对，通过“传帮带”，在日常教学研讨、备课中融入 AI 应用指导，降低学习难度，提升教师参与 AI 相关提升活动的意愿。            |
|      | 增强内部动机  | 认可价值     | 认可 AI 的作用、价值等 | 开设适量有实际教学意义的活动，让教师切实体会到正确使用 ai 对其教学实践的辅助作用，例如可以减轻教学负担以及提升学生某方面技能，这样可以更有动力。               |
|      |         | 成就感      | 内心获得成就感       | 建立“AI 教学成果展示机制”：定期开展校内 AI 教学应用成果展，教师用 AI 设计的英语课件、智能作业、个性化学习方案等可进行展示交流，优秀成果在校内推广，增强教师成就感， |

| Theme                 | Sub-theme                              | Code                     | Description                                                                | Quotation                                                                                                                                                                                                                     |
|-----------------------|----------------------------------------|--------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enhancing AI Literacy | More practice-oriented activities      | Practical AI training    | Training activities related to practical, teaching-related AI applications | “Organise more AI training that integrates AI with teaching, offering AI practice sessions closely aligned with classroom contexts to help teachers quickly acquire practical skills.”                                        |
|                       |                                        |                          |                                                                            | “Based on teachers’ teaching needs, conduct AI tool hands-on training to demonstrate how AI can be integrated into teaching.”                                                                                                 |
|                       |                                        | Practice opportunities   | Applying AI in teaching practice                                           | “Establish ‘AI + English teaching’ workshops to allow teachers to design English reading materials with AI tools, such as AI-assisted personalised reading exercises, and to improve their functional abilities in practice.” |
|                       |                                        |                          |                                                                            | “Create ‘AI + English teaching’ practice bases, where teachers can develop lesson plans and materials for real-life teaching contexts, and conduct application training through authentic scenarios.”                         |
|                       | Enriching activity formats and content | Diverse training formats | Various types of training formats                                          | “Combine online and offline modes to complete relevant training activities.”                                                                                                                                                  |
|                       |                                        |                          |                                                                            | “Design cross-disciplinary teaching projects so that teachers from different subjects can collaborate and integrate AI into activities such as English language events.”                                                      |

|  |                                                              |                            |                                                    |                                                                                                                                                                                                          |
|--|--------------------------------------------------------------|----------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                              | Subject-related training   | AI training content related to specific subjects   | “Organise ‘AI teaching workshops’ where teachers use AI tools to create subject-specific teaching materials, such as developing courses for reading and vocabulary learning using AI.”                   |
|  | Providing AI-related CPD activities based on teachers’ needs | Listening to teachers      | Respecting teachers’ ideas and opinions            | “In AI-related CPD activities, listen more to teachers’ suggestions regarding content, format, and focus, and avoid top-down, leader-imposed arrangements.”                                              |
|  |                                                              | Meeting teaching needs     | Teaching needs-oriented                            | “Design tiered AI training tailored for teachers with different levels of AI literacy, such as introductory sessions for AI basics, AI-assisted writing tools, and personalised lesson planning.”        |
|  |                                                              |                            |                                                    | “Analyse the AI technical needs of teachers across different subjects and integrate them into curriculum design and practical teaching.”                                                                 |
|  | Updating resources/equipment                                 | AI equipment and resources | AI hardware, software, and facilities for teaching | “Allocate funds to purchase AI teaching devices so teachers can easily use them; ensure sufficient devices, quality internet, and necessary classroom infrastructure.”                                   |
|  |                                                              |                            |                                                    | Establish a regional AI teaching resource repository that compiles AI tools suitable for the English subject (such as intelligent essay grading and oral assessment AI) and high-quality teaching cases, |

|                      |                                   |                                   |                                                                                |                                                                                                                                                                                              |
|----------------------|-----------------------------------|-----------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                   |                                   |                                                                                | enabling teachers to access and apply them at any time.                                                                                                                                      |
|                      |                                   | Technical support                 | AI technical and staff support                                                 | “Schools should increase technical support, funding, and staff assistance for AI use.”                                                                                                       |
|                      |                                   |                                   |                                                                                | “There are no appropriate and effective ways to regulate students' use of AI devices. .”                                                                                                     |
| Enhancing Motivation | Strengthening external incentives | Policies, honours, rewards        | Including AI literacy in appraisal systems, linking with awards and promotions | “Include AI literacy in teacher performance appraisal, link with promotions, and provide more rewards and career development opportunities for teachers who perform well in AI-related CPD.” |
|                      |                                   | Competitive opportunities         | Using competitions to encourage participation                                  | “Organise inter-school AI teaching competitions to enhance AI literacy and increase enthusiasm for CPD participation.”                                                                       |
|                      |                                   | Peer assistance and encouragement | Promoting mutual support and learning among colleagues                         | “Encourage teachers with strong AI skills to mentor others through workshops, sharing sessions, and collaborative projects to enhance participation.”                                        |
|                      | Strengthening internal motivation | Recognising value                 | Helping teachers recognise the value and benefits of AI in teaching            | “Let teachers see concrete examples of AI assisting teaching and improving efficiency, so they perceive its value.”                                                                          |

|  |  |                      |                                                                    |                                                                                                                                                                                                                                 |
|--|--|----------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | Sense of achievement | Creating opportunities for teachers to feel accomplished in AI use | “Provide platforms for teachers to showcase AI-assisted teaching achievements, such as lesson designs, intelligent marking systems, and personalised learning materials, to enhance their sense of achievement and motivation.” |
|--|--|----------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Appendix 12: Codebook for Interview

| 编码        | 描述                                | 例子                                                                 |
|-----------|-----------------------------------|--------------------------------------------------------------------|
| 认识了解 AI   | AI 相关的知识、原理等                      | 对 AI 基础的认知，比如我们通常很多人都知道 AI 是啥，但是对于 AI 背后的原理，AI 是怎么工作的，这些都不了解       |
| 应用 AI     | 对 AI 的应用能力                        | 我可能最多就是用 AI 回家长邮件，因为这种的话，我可以迅速的把我的需求输进去。它就会出来一个模板，然后我再去修改          |
| 评价 AI 的使用 | 使用 AI 之后对于使用情况（合适与否、产出内容是否满意等）的评价 | 包括我常常认为 AI 给的东西一定就是真的、对的，然后 AI 给的翻译也一定是最好的，这样其实是不好的。               |
| AI 伦理     | 隐私、安全等                            | 但伦理道德，比如隐私、安全等方面我觉得就我就没有考虑那么多                                      |
| 能力支持      | 学校通过各种相关的活动支持帮助老师们提升个人和专业能力       | 公立学校活动更加多，教研、上课比赛、公开课都会比较多                                         |
| 自主性支持     | 学校支持老师们自主选择参与、组织相关活动等             | 我们会有很多的活动提供给我们，然后我们去自愿参加。                                          |
| 同事支持      | 学校同事之间互相帮助、氛围很好等                  | 我们学校是周二一天是不给英语老师排课表的，所以我们周二就是我们统一教研活动，老师们针对不同主题进行研讨和分享，然后下午就去统一进修。 |
| 内在动机      | 为了个人兴趣、喜好、成就感等参加相关活动，意识到很重要而参加活动  | 他可能对 AI 比较有热情，本身又比较好学                                              |
| 外在动机      | 因为政策、奖励、压力等外在因素参加活动               | 看得见回报，评优加分和一些奖金补贴，还有绩效补贴。如果看得见回报的话，他们可能就会主动参与，然后会有热情、愿意参与          |

|           |                                  |                                                                                           |
|-----------|----------------------------------|-------------------------------------------------------------------------------------------|
| 个人原因      | 兴趣、喜好、时间冲突、经济等个人相关的因素            | 可能私立学校的老师更多会有一些理想抱负吧，如果觉得学习这个有用，感兴趣，他们会去学。                                                |
| 学校相关原因    | 学校层面的因素，比如学校内的政策、机会、经济、工作量、工作安排等 | 因为他们会有业绩、教学成果的要求，把学校的升学率、家长的满意度作为考核的目标。                                                   |
| 政府/国家相关原因 | 政府国家层面的因素，比如自上而下的政策、经济、导向等       | 我们教育局主办的这些普惠性的一些培训，是上级安排下来，政策要求必须参加，这类培训会比较多。而私立学校我觉得他们更多的是为了提升一些自身的产品自身的竞争力，开展一些主动的一些培训。 |

| Code              | Description                                                                                                | Example                                                                                                                                 |
|-------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Understanding AI  | Knowledge of AI-related concepts, principles, etc.                                                         | Basic knowledge about AI, many people know that AI is “smart,” but they do not understand the principles behind it or how it works.     |
| Applying AI       | Ability to apply AI                                                                                        | My ability might be to reply to students’ emails using AI. If it can generate a draft according to my needs, I can then make revisions. |
| Evaluating AI Use | Evaluation of AI use in terms of appropriateness, usefulness, and satisfaction                             | Using AI for translation — it might be fast and accurate, but the translation may not always be the best, so this is a drawback.        |
| AI Ethics         | Issues such as privacy and security                                                                        | I seldom consider problems regarding privacy and security.                                                                              |
| Ability Support   | Activities organized by schools to support teachers in improving their personal and professional abilities | Public school teachers have more activities, training sessions, open classes, and lectures.                                             |
| Autonomy Support  | Support for teachers to choose and organize activities independently                                       | Many activities are offered to us, and then we decide whether to participate voluntarily.                                               |

|                                   |                                                                                                                                           |                                                                                                                                                            |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Colleague Support                 | Mutual help among colleagues in the school and a good atmosphere                                                                          | In our school, teachers take turns giving demonstration lessons, and we often share teaching ideas and conduct group discussions every Tuesday afternoons. |
| Intrinsic Motivation              | Participation in activities because of personal interest, enjoyment, sense of achievement, etc., considering them important and enjoyable | Some teachers may join because they find the topic interesting or personally valuable.                                                                     |
| Extrinsic Motivation              | Participation in activities because of external factors such as policies, rewards, or pressure                                            | Some teachers join because they can gain points for performance evaluation, awards, or certificates.                                                       |
| Personal Factors                  | Factors related to personal interest, enjoyment, available time, energy, and finances                                                     | Some teachers in private schools may feel passionate about AI, and consider it helpful and interesting, so they participate.                               |
| School-Level Factors              | Factors related to school policies, opportunities, funding, workload, and career development                                              | Schools may encourage teachers' professional growth and offer promotions, which increase motivation.                                                       |
| Government/National-Level Factors | Factors related to policies, funding, and leadership from the government                                                                  | Government-led initiatives and requirements may push teachers to participate in training and development more actively.                                    |

## Appendix 13: Thematic Tables of Interview Quotations

### AI literacy

| 主题     | 子主题  | 被采访者学校类型 | 被采访者序号 | 引文                                                                                                                                                                                                                                     |
|--------|------|----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 人工智能素养 | 概念理解 | 公        | PUB7   | 我觉得它应该包含这几个方面，一是对 AI 基础的认知，另一个就是对它的技术原理和概念的理解能力和 AI 工具的应用和实操能力。大家根据自己的工作和生活场景来具体使用某一个 AI 产品，就比如有的用 AI 写写文章啊，有的用 AI 做做搜索，做信息检索，有的用来生成图片呀，有的用来办公。还有第三方面，就是对于对于 AI 所返回的结果的认知和处理能力。AI 生成一个结果之后，我们要有最基本的质量的判断，并且能够结合它生成的结果及自身的实际来生成一个有效的成果。 |
|        |      | 公        | PUB6   | 比如利用一些 AI 的应用，进行简单的数据处理和分析的能力。                                                                                                                                                                                                         |
|        |      | 公        | PUB5   | 运用这种 AI 工具的一个意识，然后能够清楚的知道你用这些工具的目的是什么，而且你自己做为一个教师，能够清楚的知道 AI 做为一个工具在教学当中所扮演的角色是什么。                                                                                                                                                     |
|        |      | 私        | PR4    | 要知道如何去获得使用 AI 工具，它有哪些功能能够如何去运用 AI 去帮助教学，同时也能够给到学生一些如何去运用 AI 的技巧技能，并且能够识哪些作品是用 AI 帮助生成的。                                                                                                                                                |
|        |      | 私        | PR1    | AI 素养就是你去管理和把控自己应用 AI 的能力。                                                                                                                                                                                                             |

|  |         |   |      |                                                                                                                                                      |
|--|---------|---|------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |         | 私 | PR3  | 知道怎么选择怎么去应用 AI，或者怎么去更高效更专业应用 AI，然后更能给学生一个很好的方法去利用这个 AI。老师们要具有个人学习能力，根据不同 AI 工具的不同特色去选择不同的工具。                                                         |
|  | AI 素养水平 | 公 | PUB5 | 我觉得可能也就是个非常一般的水平吧，就是可能一个及格边缘...但是教研活动呢中发现，有老师在深度融合 AI 进听说读写课堂这块做得非常好，对于各种 AI 工具的应用很广泛，我在这方面就比较欠缺。                                                    |
|  |         | 公 | PUB7 | 我觉得我自己吧水平一般般，就像我开始说的那 3 个 AI 应该包含哪几方面能力，我其实现在更多的都聚焦在第二点上面，就是在 AI 的使用上，然后对于第一点，AI 的它的底层逻辑，它的技术原理，我一直还在慢慢琢磨中，                                          |
|  |         | 公 | PUB8 | 我觉得我检索信息的能力就是这种熟练能力，包括多平台验证啊，这种能力应该还是有的，就是我会多方面去验证，但伦理道德，比如隐私和安全等方面我觉得就我就没有考虑那么多，甚至完全没有在我考虑范畴上。                                                      |
|  |         | 私 | PR4  | 我觉得我的素养应该不算很高...没有那么的依赖 AI，我可能最多就是用 AI 回家长邮件，因为这种的话，我可以迅速的把我的需求输进去，它就会出来一个模板，然后我再去修改，这样比我直接打字会快很多，我也不需要去思考太多托词什么的，但是如果是给学生布置作业，或者是说批改作业什么的，我基本都是自己来的 |

|  |        |   |      |                                                                                                                                                                                                |
|--|--------|---|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |        | 私 | PR 1 | 现在很多的老师，包括我常常认为 AI 给的东西一定就是真的、对的，然后 AI 给的翻译也一定是最好的，这样其实是不好的。                                                                                                                                   |
|  |        | 私 | PR 3 | AI 应用方面不是特别好，可能是我坚持用的不够久吧，因为觉得它比较麻烦，就是每次你在给它输入一些指令的时候，其实你给它说特别详细，让它做符合你的要求的那种课程设计，但是它理解不了，花很多时间做不出来自自己想要的                                                                                      |
|  | 学校相关原因 | 公 | PUB9 | 我们公立学校可能就比较依赖学校统一采购的一些 AI 的系统，比如智慧校园平台，然后财务方面可能就受到一些限制。像一些私立的学校，他们可能更敢花钱，因为学校比较有钱，而且就是愿意投资，然后资金也比较灵活。公立学校我们会定期培训，让我们学一些比较新的知识，但像私立的学校的话，老师他们可能就是会自己去探索，竞争也比较激烈。                                |
|  |        | 私 | PR 3 | 学校给提供的 AI 培训或者是 AI 的学习机会多少有一定关系。公立学校，他们可能会就是已经习惯了当下的一种教学模式啊，为了中考、高考，他们不使用 AI 也可以拿出很好的成绩，就是也可以完成他们的 KPI，他们也不会说有太多的额外的学习、改革革新的压力。私立学校可能年轻人就会多一些，然后大家的不稳定性其实比公立要更强一些，各方面压力可能会更多一点，更需要学习 AI 这种新事物。 |

|  |        |   |       |                                                                                                                                                                                     |
|--|--------|---|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 政府相关原因 | 私 | PR 1  | <p>公校老师是有边界边界和限制的。就是在这个边界内，他们才可以进行一些活动...我不知道政策的推出和实际的落实中间会差了多少，但是至少你要有一个文件给到学校，或者你要给一个方向到学校，你现在什么都没有...</p>                                                                        |
|  |        | 公 | PUB 6 | <p>公立校总的负责群体是包括政府，学校的领导，甚至于国家的一些政策支持，是这些群体去负责活动规划及经费、政策支持的话可能他需要自己去承担或者老板去承担这个经济支出...所以我觉得可能公立校机会会更多吧，我们反正是比较多的</p>                                                                 |
|  |        | 公 | PUB 7 | <p>我可能觉得公立学校的在 A1 这一块的宣传推广上面可能会更好一点。因为公立学校，毕竟他是一个普遍教育，更受国家的一些政策的引导。比如我们上级部门，政府教育局，他对这方面有一些规划，所以说呢，我们接触的安排可能会更有计划性，规划性，而私立学校据我了解，他们当然是以盈利生存为主，他们的老师当然也会去接触这些东西，但他们更多的是为了解决现有的问题。</p> |
|  |        | 私 | PR 4  | <p>跟内部培训有关吧，但是说实话，我们这里也没有系统性的培训。</p>                                                                                                                                                |



## School support

| 主题   | 子主题   | 被采访者学校类型 | 被采访者序号 | 引文                                                                                                                                                                                                 |
|------|-------|----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 学校支持 | 能力支持  | 公        | PUB7   | 我听过的这些培训课，他们更多的在介绍的层面上，我觉得比较单一，比如那些介绍一些 AI 产品使用的培训，他可能整堂培训课下来，就单独针对那个产品做介绍，教你怎么用，在各种场景下给你做一些 demo...不是站在我们英语老师这个角度来思考，我们想怎么用这个产品。贴合我们工作实践的培训还是比较少。大家都是从某个很小的一个切口，在使用这些 AI 产品，没有完全挖掘出 AI 在教学这一块的能力。 |
|      |       | 私        | PR2    | 印象当中公立学校活动更加多，教研、上课比赛、公开课都会比较多。那可能他们都这方面的培训也会更加多一点。私立学校的话，没有政府的把控，所以要完全看学校本身，                                                                                                                      |
|      |       | 私        | PR3    | 提供最多的就是 AI 方面的讲座，这个是比较多的，然后其他形式的支持个人觉得不多，有用的活动好像也并不多。                                                                                                                                              |
|      | 自主性支持 | 公        | PUB6   | 我们会有很多的活动提供给我们，然后我们去自愿参加，包括一些线上的线下的一些活动都会有。                                                                                                                                                        |
|      |       | 私        | PR3    | 公立学校老师他们就很忙，学校也不会说给给他们去安排额外的休息，就要求他们参加培训。                                                                                                                                                          |
|      |       | 私        | PR2    | 目前的话，就是我们（私立学校）参加和使用全凭老师们自己的兴趣、个人的喜好和资源。                                                                                                                                                           |

|  |        |   |      |                                                                                                                            |
|--|--------|---|------|----------------------------------------------------------------------------------------------------------------------------|
|  | 同事支持   | 公 | PUB5 | 我们学校是周二一天是不给英语老师排课表的，所以我们周二就是我们统一教研活动，老师们针对不同主题进行研讨和分享，然后下午就去统一进修。                                                         |
|  |        | 私 | PR4  | 没有每周的统一教研，都是老师自己单独问来问去的，都是自己个人去问的，或者是说同事之间会在办公室分享一些内容，比如哪个 AI 用来给家长写邮件比较好用之类的。                                             |
|  |        | 私 | PR2  | 主要形式可以是分享吧，比如说某一个老师，他用什么东西用的特别好一起分享一下。或者做一个分享会，大家都分享自己当下所用的一些软件，然后一起去讨论。                                                   |
|  | 学校相关原因 | 公 | PUB5 | 费用蛮高的，我这个学校会报销费用，但对私立学校老师来说可能就有负担。还有就是名额很有限，我们校内都还要先到先得抢名额，私立学校老师也不知道会不会有机会。                                               |
|  |        | 公 | PUB9 | 我们公立学校可能就更加依赖学校的财政拨款，钱就比他们少。钱少的话，一些培训可能就是会受限于教育部门的预算。超过预算了，那可能就没法进行了。私立学校的话他们可能就会就出大价钱，去请一些比较年长的或者说比较专业的老师去给他们开展一些研讨会或者讲座。 |

|  |        |   |      |                                                                                                                                       |
|--|--------|---|------|---------------------------------------------------------------------------------------------------------------------------------------|
|  |        | 私 | PR 3 | 公校跟私校，它的目的是不一样的，公校可能更多的还是为了中考高考的成绩。但私校其实它可能会更加注重，除了成绩以外，会注重学生的综合能力和素质的提升，会有更多的实践活动、学术活动。那 AI 其实也可以算作学生学术活动里面的重要的部分，会更注重老师和学生这方面能力的培养。 |
|  | 政府相关原因 | 公 | PUB7 | 我们教育局主办的这些普惠性的一些培训，是上级安排下来，政策要求必须参加，这类培训会比较多。而私立学校我觉得他们更多的是为了提升一些自身的竞争力，参加一些培训。                                                       |
|  |        | 私 | PR 1 | 我不知道推出政策和实际落实中间会差多少，但是至少你要有一个文件给到这里，或者你要有一个就是方向给到学校。你现在什么都没有。                                                                         |
|  |        | 私 | PR 4 | 国内对于 AI 的培训肯定是有政府或者是区里，从上至下的培训。因为我感觉公立学校，它肯定是受政府的监管会比较多，那肯定会有一些制度上的规范和要求，会有比较系统性的培训，那 AI 相关的培训机会应该也不会少。                               |

## Motivation

| 主题   | 子主题  | 被采访者学校类型 | 被采访者序号 | 引文                                                                                                     |
|------|------|----------|--------|--------------------------------------------------------------------------------------------------------|
| 参与动机 | 外在动机 | 公        | PUB9   | 看得见回报，评优加分和一些奖金补贴，还有绩效补贴。如果看得见回报的话，他们可能就会主动参与，然后会有热情、愿意参与。                                             |
|      |      | 公        | PUB7   | 我觉得是外在压力的主导，就像我们前面说的那些被动学习，上级要求你学，你必须得学。然后还有一个就是绩效驱动，比如在教学中，把 AI 和英语教学相结合应用这一块儿来制定一些绩效评价机制，那这可能驱动我们参加。 |
|      |      | 私        | PR3    | 如果能帮助我提升工资，能帮助我的事业越来越好，然后能帮助我发展越来越好，那我肯定是愿意去参加的。                                                       |
|      |      | 私        | PR3    | 公立学校的老师有评职称之类的，你如果不去学这个的话，或者说你不参加学校安排好这个培训的话，可能会影响你的工作，所以就必须参加。                                        |
|      | 内在动机 | 公        | PUB9   | 有一些教师可能就是想通过一些 AI 的技能去提升自己的教学效率，或者说提升自己，同时他可能对 AI 比较有热情，本身又比较好学                                        |
|      |      | 公        | PUB8   | 为了提升自身的能力，这件事情对我有利，我才去做。意识到提升 AI 素养对个人前途、发展或者教学能力，教学质量有帮助，就想去提升。                                       |

|  |      |   |      |                                                                                                                                                 |
|--|------|---|------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|  |      | 公 | PUB7 | 我觉得还是个人对知识，对前沿信息的好奇心驱动吧。至少我们这个年龄段的老师，对于这些前沿技术感兴趣。不是把学习 AI 相关知识当做一个外在的工作任务去做，更多的是主动愿意去接受这些信息，愿意去学，愿意把它和我们的工作实践、教育教学相结合，这个欲望和驱动，我觉得这也应该占 70% 是有的。 |
|  |      | 私 | PR4  | 那如果是长期坚持下来有帮助的事情，而且不会在短时间内影响太多我目前的工作量。那应该是会比较愿意去参加..还有就是如果老师参加或者分享了，他们一个 title 或者奖励，让他获得荣誉感...                                                  |
|  | 阻碍因素 | 公 | PUB9 | 我感觉最大的最阻碍因素应该是工作超负荷了。工作量特别大，就超负荷了，就会不喜欢教学。然后每天还需要去教学，改作业，去处理学校和个人私事，处理学生的一些事情，就没有时间去参加这些额外的培训。感觉很累，就很抗拒参加。还有就是感觉自己可能学不会，然后就不想去学                 |
|  |      | 公 | PUB8 | 就是他有自己的一套东西，他就钻研自己的那一套方法，就可以搞出成绩，他可能他就觉得没必要、也不想去参加这些 AI 相关的培训活动的。                                                                               |
|  |      | 公 | PUB5 | 一些客观的原因，比如说我可能家里有孩子要养，或者是有老人要赡养。因为培训基本上都是一天，他从早上 8 点可能到下午 4 点，中间有一个中午吃中餐的时间，这一天就会蛮累的。                                                           |
|  |      |   |      |                                                                                                                                                 |

|  |        |   |       |                                                                                                                                |
|--|--------|---|-------|--------------------------------------------------------------------------------------------------------------------------------|
|  |        | 私 | PR 4  | 就时间吧，因为我觉得我们学校排课量是非常满的，每天一共五节课，我平均就是每天上 3/4 节一个小时的课。                                                                           |
|  |        | 私 | PR 3  | 现在学校提供给老师的培训也真的是没有什么用，就是很虚的一些东西。                                                                                               |
|  | 个人相关原因 | 私 | PR 3  | 可能私立学校的老师更多会有一些理想抱负吧，如果觉得学习这个有用，他们会去学。                                                                                         |
|  | 学校相关原因 | 公 | PUB 9 | 私立学校老师动机可能会更强，因为他们会有业绩、教学成果的要求，把学校的升学率、家长的满意度作为考核的目标。                                                                          |
|  |        | 公 | PUB 7 | 我觉得培训机会和资源或多或少也有一些影响。比如在我们单位内部，经常开展相关的培训活动，甚至是专门有这么一堂课，大家随时可以去学，或者这种类型的线上课程。大家随时随地有空了，都可以去学。所以说这个资源的丰富度，这个资源可获得的难易度，我觉得也是一个影响。 |
|  |        | 公 | PUB 5 | 公立学校的很多老师因为要去评职称，要求老师必须完成一定的继续教育培训课时                                                                                           |
|  | 政府相关原因 | 私 | PR 4  | 那如果是区里或者政府要求的，他就不得不去呀，那像私立学校，没有什么硬性要求去参加什么培训，或者是说一定要发言什么的                                                                      |

## AI Literacy

| Theme       | Subtheme                 | School Type | Interviewee ID | Quotation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|--------------------------|-------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AI Literacy | Conceptual Understanding | Public      | PUB 7          | 1. I think it should cover several aspects. The first is a basic understanding of AI, and the second is the ability to comprehend its technical principles and concepts, as well as the ability to apply and operate AI tools. People use specific AI products according to their work and life contexts—for example, some use AI to write articles, some to conduct searches, retrieve information, generate images, or perform office tasks. The third aspect is the ability to interpret and process the results returned by AI. After AI generates an output, we should have at least a basic ability to evaluate its quality and be able to combine the generated result with our own context to produce an effective outcome. |
|             |                          | Public      | PUB 6          | 2. The ability to apply AI in real-life contexts and conduct analytical thinking about its application is essential.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|             |                          | Public      | PUB 5          | 3. When applying AI tools, one needs to not only understand the functions but also integrate them with teaching goals to maximize their effectiveness.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|             |                          | Private     | PR 4           | 4. It is important to know how to access AI resources, and the tools used must be capable of improving teaching. Teachers also                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|  |                    |         |       |                                                                                                                                                                                                                                                                             |
|--|--------------------|---------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                    |         |       | need practical skills to operate them and problem - solving abilities to use them effectively in teaching.                                                                                                                                                                  |
|  |                    | Private | PR 1  | 5. A I literacy should include both knowledge and the ability to apply A I tools in practical teaching.                                                                                                                                                                     |
|  |                    | Private | PR 3  | 6. Teachers should know how to choose and apply A I tools appropriately, designing teaching according to different functions of the tools.                                                                                                                                  |
|  | A I Literacy Level | Public  | PUB 5 | 7. I think my own A I literacy level is average. From research activities, I have observed that some teachers' A I literacy levels are really high. They have in-depth understanding of A I and the skills to operate A I tools, but I to some extent lack such competences |
|  |                    | Public  | PUB 7 | 8. I think my own A I literacy level is average. I can use A I for certain tasks, but my knowledge of A I's broader application and principles is limited. Regarding deep human – A I interaction, I have been learning continuously.                                       |
|  |                    | Public  | PUB 8 | 9. I think my ability to filter and verify information is not bad, including being able to evaluate information from multiple perspectives and verify reliability. I seldom consider issues related to ethics.                                                              |

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|  |                        | Private | PR 4  | 10. I feel my AI literacy is limited. For example, I may only be able to use AI for simple tasks such as generating templates. I do most tasks myself such as giving students assignments.                                                                                                                                                                                                                                                                                                                                                                               |
|  |                        | Private | PR 1  | 11. Many teachers including me often think what AI has provided for them is real, and correct. For example, they think AI translates better. This is not good.                                                                                                                                                                                                                                                                                                                                                                                                           |
|  |                        | Private | PR 3  | 12. I don't do well in AI application, maybe because I don't use AI much. I think it isn't efficient sometimes. When I give AI detailed information and expect it to give me a good course design, it sometimes fails me and takes too much time.                                                                                                                                                                                                                                                                                                                        |
|  | School-Related Reasons | Public  | PUB 9 | 13. In our public school, we may rely more on AI systems procured centrally by the school, such as smart campus platforms, but our financial resources may be somewhat limited depending on the government support. In contrast, some private schools might be more willing to spend money because they are better funded by themselves, more willing to invest, and have more flexible budgets. In public schools, we have regular training to learn new knowledge, but in private schools, teachers may explore on their own, and the competition can be more intense. |

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|  |                            | Private | PR 3  | 14. The amount of AI training or learning opportunities provided by the school does make a difference. Public schools may be more accustomed to the current teaching model, focusing on the high school and college entrance examinations. Even without using AI, they can still achieve good results and meet their KPIs, so they may not feel much additional pressure for extra learning, reform, or innovation. In private schools, there may be more young teachers, and overall, instability tends to be higher than in public schools, with greater pressures in various aspects, which might make learning new things like AI more necessary. |
|  |                            | Private | PR 4  | 15. It might be related to internal training, but to be honest, we do not have systematic training here.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  | Government-Related Reasons | Public  | PUB 7 | 16. I think public schools may do a better job in promoting and publicizing AI, because public schools are part of general education and are more influenced by national policies. For example, higher-level authorities like the local education bureau may have plans in this area, so the arrangements we encounter tend to be more planned and systematic. In private schools, from what I know, they are primarily profit-oriented. Their teachers will also engage with AI, but more for practical purposes and to solve immediate                                                                                                              |

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|  |  |         |       | problem s.                                                                                                                                                                                                                                                                                                                                                                                          |
|  |  | Public  | PUB 6 | 17. In public schools, the groups responsible include the government, school leaders, and even national policy support. These groups handle activity planning, funding, and policy support. In private schools, they may need to cover the costs themselves, or the owner may bear the expenses. So, I think public school teachers may have more opportunities; we do get quite a lot.             |
|  |  | Private | PR 1  | 18. Public school teachers work within certain boundaries and constraints. Within these boundaries, they can carry out certain activities. I am not sure how much difference there is between the introduction of policies and their actual implementation, but at the very least, you need to have a formal document sent to the school or provide a clear direction. Right now, there is nothing. |

## School Support

|                |                    |         |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| School Support | Competence Support | Public  | PUB7 | 19. The AI training courses I have attended focus mostly on product introductions, which I find rather narrow in scope. For example, in some sessions, the entire training is devoted to introducing a single AI product, teaching participants how to use it, and demonstrating it in various scenarios. The training is not usually designed from the perspective of English teachers, nor does it fully address how we might use such products in our own teaching practice. Training closely aligned with our actual work is relatively rare. Most people approach these AI tools from a very narrow entry point, without fully exploring their potential for teaching. |
|                |                    | Private | PR2  | 20. I think public schools are generally more systematic in arranging such activities. They might provide more opportunities for training, research activities, competitions, open classes, and practical application. Without such arrangements, private schools rely entirely on their own resources.                                                                                                                                                                                                                                                                                                                                                                     |
|                |                    | Private | PR3  | 21. The most common form of support provided is lectures on AI, which are relatively frequent. Other types of support are, in my view, limited, and there do not seem to be many activities that are genuinely useful.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                | Autonomy Support   | Public  | PUB6 | 22. We have many activities to choose from, and we can voluntarily participate. Some are even online                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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|  |                   |         |       | activities that we can take part in.                                                                                                                                                                                                                                 |
|  |                   | Private | PR 3  | 23. Public school teachers are already very busy, and the school does not arrange additional rest periods for them ; instead , they are required to participate in the training.                                                                                     |
|  |                   | Private | PR 2  | 24. At present, in our (private) school, the use and learning of AI is full of our own interests and resources, and everyone is quite free to explore AI.                                                                                                            |
|  | Collegial Support | Public  | PUB 5 | 25. Our school has research activities every Tuesday, so we often communicate with other teachers. The teachers are very willing to share with each other.                                                                                                           |
|  |                   | Private | PR 4  | 26. There are no regular meetings every week, so sharing and communication mainly happen between individual teachers. Sometimes colleagues will share some ways to use AI more effectively in the office, such as how to use AI and which AI to use to write emails. |
|  |                   | Private | PR 2  | 27. It is mostly informal sharing. For example, if a teacher has a special skill, they might share it. Or, during a small sharing session, everyone might share a few tools they personally use and then try them together.                                          |
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|  | School- related<br>Reasons        | Public  | PUB5 | 28. The costs are quite high, though my school reimburses them. For private school teachers, however, this might be a financial burden. In addition, the number of places is very limited, and even within my school they are allocated on a first-come, first-served basis. It is uncertain whether private school teachers would have the same opportunities. |
|  |                                   | Public  | PUB9 | 29. In public schools, the purchase of A I equipment needs approval, and if the budget is exceeded, training sessions may not go ahead. In private schools, such restrictions may be less strict. They may invite experienced teachers to conduct a seminar.                                                                                                    |
|  |                                   | Private | PR3  | 30. Public and private schools have different goals. Public schools might focus more on students' academic performance. Private schools may value overall quality and capability more, and therefore put more emphasis on practical activities and academic events. A I may also be seen as part of the overall development of teachers and students.           |
|  | Government-<br>related<br>Reasons | Public  | PUB7 | 31. Some basic training arranged by the education bureau is mandatory for us, as it comes from higher-level authorities. Private school teachers participate in those activities maybe because they want to enhance competitiveness.                                                                                                                            |

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|  |  | Private | PR 1 | 32. I do not know the exact gap between government policy and its implementation, but at least you need to have an official document sent to the school, or give the school a clear direction. Right now, we have nothing.                                                                                                                                                           |
|  |  | Private | PR 4 | 33. Training on AI in China is generally provided through a top-down approach from the government or district authorities. Since public schools are more closely supervised by the government, there are certain regulations and requirements in place, which lead to relatively systematic training. Opportunities for AI-related training should therefore be relatively abundant. |

### Motivation

| Theme                    | Sub-theme           | School Type | Participant ID | Quotation                                                                                                                                                                                                                                                                                                     |
|--------------------------|---------------------|-------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Participation Motivation | External Motivation | Public      | PUB9           | 34. If there is a reward, such as an award certificate or a cash prize, and it is effective, if the reward is substantial, they may be more willing to participate and will be more motivated to join.                                                                                                        |
|                          |                     | Public      | PUB7           | 35. I think it is mainly driven by external pressure, just like the passive learning we mentioned earlier — when authority departments require you to learn, you have to learn. Another factor is performance-driven motivation; for example, in teaching, incorporating AI into English language teaching to |

|  |                        |         |      |                                                                                                                                                                                                                                      |
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|  |                        |         |      | develop certain performance evaluation mechanisms may drive us to participate.                                                                                                                                                       |
|  |                        | Private | PR3  | 36. It can help me increase my salary, improve my teaching efficiency, and then help me with my career development. That is actually the motivation for participating.                                                               |
|  |                        | Private | PR3  | 37. For public school teachers, there are things like evaluation for professional titles — if you don't learn this, or you don't attend the training arranged by the school, it may affect your work, so you have to participate.    |
|  | Internal<br>Motivation | Public  | PUB9 | 38. Some teachers may simply want to use certain AI skills to improve their teaching efficiency, or to improve themselves. At the same time, they may be quite enthusiastic about AI and are, by nature, eager to learn.             |
|  |                        | Public  | PUB8 | 39. In order to improve my own abilities, I will only do it if it benefits me. Realizing that improving AI literacy helps my career prospects, professional development, or teaching ability and quality motivates me to work on it. |
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|  |                  | Public  | PUB7 | 40. I think it is still mainly driven by personal curiosity about knowledge and cutting-edge information. At least for teachers in our age group, we are interested in these emerging technologies. We don't treat learning AI-related knowledge as just an external work task, but rather as something we are willing to actively embrace, learn, and integrate with our teaching practice and education. This desire and drive probably accounts for about 70%. |
|  |                  | Private | PR4  | 41. If it is something that is helpful in the long term and will not significantly affect my current workload in the short term, I would be more willing to participate. Also, if teachers receive a title or award after participating or sharing, it gives them a sense of honor.                                                                                                                                                                               |
|  | Impeding Factors | Public  | PUB9 | 42. If the workload at hand are too heavy, it may be hard to balance work and training. It takes too much time and energy, and sometimes it's really tiring. For example, if I have to teach, prepare lessons, manage students, and deal with personal matters, it's too exhausting. Sometimes I have to work overtime to handle urgent issues, and if that happens, I won't want to participate.                                                                 |

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|  |                        | Public  | PUB8 | 43. If they already have a set of plans and routines, they will just follow them, and they may not feel it is necessary to participate in additional training or activities.                                                                                    |
|  |                        | Public  | PUB5 | 44. There are also some objective reasons. For example, I may have children to raise or elderly family members to care for. Since most training lasts an entire day — from around 8 a.m. to 4 p.m., with a lunch break in between — it can be quite exhausting. |
|  |                        | Private | PR4  | 45. Time is tight because I already have a heavy class schedule. I have three to four classes a day, and each class last for one hour.                                                                                                                          |
|  |                        | Private | PR3  | 46. At present, the training provided to teachers in our school is not very useful, and some is irrelevant to my work.                                                                                                                                          |
|  | Personal Reasons       | Private | PR3  | 47. Private school teachers may have more ideals and aspirations. If they think learning this is useful, they will take the initiative to learn it.                                                                                                             |
|  | School-Related Reasons | Public  | PUB9 | 48. The motivation for private school teachers may be stronger because they have requirements for teaching outcome, and they take the school's university admission rate and parents' satisfaction as evaluation targets.                                       |

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|  |                            | Public  | PUB 7 | 49. I think the availability of training opportunities and resources also has some influence. For example, in our institution, relevant training activities are often held, and there is even a dedicated course for this. Teachers can learn it at any time, or take this type of online course. As long as they have spare time, they can learn anytime and anywhere. So I think the abundance of resources and the ease of access to these resources are also influential factors. |
|  |                            | Public  | PUB 5 | 50. Many public school teachers need to complete a certain number of continuing education training hours for evaluation of professional title or certificate.                                                                                                                                                                                                                                                                                                                         |
|  | Government-Related Reasons | Private | PR 4  | 51. If it's required by the school or by a superior, then you have to go. If there is no requirement, then you may or may not go, but if there is a requirement, you definitely have to attend.                                                                                                                                                                                                                                                                                       |