

Collaboration among Tertiary English Teachers in Chinese Universities: Attitudes and the Role of Technology in Collaborative Practice


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 <https://orcid.org/0009-0006-2018-3686>

 <https://doi.org/10.54855/callej.252648>

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Received: 31/01/2025

Revision: 23/07/2025

Accepted: 21/08/2025

Online: 22/09/2025

ABSTRACT

Keywords: English teachers at tertiary level; Collaboration; Attitude; Technology

Effective teacher collaboration is critical for professional growth in the 21st century. However, teacher collaboration in China faces two significant challenges: a lack of awareness and a limited willingness among educators to engage in collaborative practices. Despite the importance of this issue, little is known about the attitudes of tertiary English teachers toward collaboration, or the role technology plays in fostering collaborative practices. This study aims to address these gaps by investigating the attitudes of tertiary English teachers on collaboration and examining how technology influences their collaborative activities. Using a mixed-methods design, data were collected from 219 full-time English teachers at universities in China through a 5-point Likert scale questionnaire. Additionally, 20 full-time English teachers participated in interviews. The findings reveal that tertiary English teachers generally have a positive attitude toward collaboration. Tertiary English teachers adopt various digital tools in their efforts to collaborate, and these have played a significant role in enhancing teachers' willingness to facilitate the collaborative process. These results underscore the importance of leveraging technology and fostering a shift in attitudes to promote a more collaborative environment among English language instructors at Chinese universities.

Introduction

Collaboration among educators is a key pillar of professional development and a crucial factor in achieving enhanced educational outcomes, particularly in the 21st century (Nguyen et al., 2020). Teacher collaboration is defined as the collective effort of a group to engage in all activities to reach a common goal or task (Vangrieken et al., 2015). Generally, the traditional isolated teaching practice makes teachers uncertain and negatively affects their professional development. It is believed that encouraging teachers to move away from isolated practices to

a collaborative culture is a positive step (Hargreaves, 2019). An educational system that promotes collaboration among teachers fosters a sense of shared responsibility and encourages more discussions about teaching and student learning among teachers (Rigney et al., 2021), which in turn contributes to the success of schools (García-Martínez et al., 2021).

In recent years, promoting collaboration among teachers has been given high priority in China, which is the cornerstone of educational reform. The “China Education Modernization 2035” plan advocates for participatory and collaborative teaching practices, promoting interdisciplinary integration to enhance the collaborative skills of both teachers and students. By bridging gaps between disciplines, fields, schools, and universities at all levels, the plan aims to promote innovation and cohesion in education. In line with this perspective, the New Liberal Arts, proposed in 2019, advocates for more transformative interdisciplinary collaboration to promote the convergence of traditional liberal arts disciplines with modern interdisciplinary approaches and technology-based methods (Long & Liao, 2021). This shift underscores the importance of collaboration and knowledge sharing among teachers in meeting the increasingly high standards of professionalism demanded in the rapidly evolving landscape of modern technologies (Rosli & Saleh, 2023).

Despite efforts to promote collaboration, various challenges persist in the field of teacher collaboration in China. Generally, English teachers in higher education work in an isolated way. They have few opportunities to communicate and collaborate with others (Borg & Liu, 2013). It is usually difficult for college English teachers to identify their strengths and weaknesses as they rarely engage in peer observation or receive feedback from colleagues. In the absence of peer support, teachers are often confined to their own teaching practices and lack opportunities for innovation, which hinders their professional development (Yu, 2021). The core problems of teacher collaboration in China stem from two aspects: an insufficient understanding of the importance of collaboration and a lack of willingness to collaborate (Liu & Xiu, 2019). Many tertiary English teachers in China are not adequately prepared to utilize modern digital tools in their collaborative efforts, rendering the application of technology in joint teaching practices ineffective and ultimately hindering potential collaboration (Zhang & Chen, 2022).

Building on this context, it would be worthwhile further to study the collaboration among English teachers in Chinese universities. It contributes to teachers’ understanding of collaboration and helps provide deeper insights into how technology facilitates collaborative practices and supports both teaching and learning. This study, therefore, attempts to explore tertiary English teachers’ attitudes towards collaboration, digital tools used in collaboration, and how technology facilitates and hinders the collaboration process.

Research Questions

The study is guided by the following research questions:

1. What are the attitudes of tertiary English teachers toward collaboration?
2. What digital tools do tertiary English teachers use to facilitate collaboration?
3. How does technology impact collaboration among tertiary English teachers?
4. What are the challenges faced by tertiary English teachers in adopting technology in their collaboration?

Literature review

Teacher collaboration is widely recognized as a critical catalyst for successful educational innovations worldwide. An increasing number of studies have highlighted its positive effects on teaching and learning (Kaur & Debel, 2019). In addition to encouraging candid communication and peer engagement, effective teacher collaboration also helps build a supportive learning environment that strengthens professional relationships (Sancar et al., 2021). Teachers' attitudes towards collaboration lie at the center as they determine their willingness to engage in collaborative activities. Positive attitudes ensure effective interaction between colleagues, enabling easy and frequent sharing of resources and ideas (Drossel et al., 2019). A positive outlook on collaboration is of great significance for sustaining effective and meaningful professional interactions in the context of education (Schuster et al., 2021).

One of the theories that can help us explain these processes and underpin this study is the Theory of Planned Behaviour (TPB). While the attitudes, subjective norms, and perceived behavioural control affect individuals' intentions and, consequently, their behaviours according to TPB (Ajzen & Driver, 1992). The attitude expresses how strongly a person feels about a certain behaviour and how aware that person is of the outcomes of that behaviour. Subjective norms reflect the social pressure or influence of the family, friends, colleagues, etc., on a person's behaviour. Perceived behavioural control reflects the person's confidence in being able to perform a behaviour (Ajzen, 1985).

Bush and Grotjohann (2020) focus on the need to shape teachers' attitudes when they enter the profession from the point of view of TPB. They emphasized that pre- and in-service teachers should understand the need for collaboration and how to enhance it. Yilmaz and Celik (2020) produced the Scale of Attitude towards Professional Collaboration among Teachers to measure teachers' attitude towards professional collaboration. Yilmaz (2022) utilized this scale to examine Turkish teachers' attitudes toward collaboration within the centralized education system. As can be inferred from these studies, it is important to create positive attitudes towards collaboration. In this way, teachers' willingness to collaborate is increased, and sustainable collaboration can be established (Drossel et al., 2019).

While attitudes are fundamental to fostering collaboration, they also play a significant role in the adoption of technological tools that enhance collaborative efforts. Research has shown a positive correlation between teachers' attitudes toward collaboration and their technological competence. For example, Mena-Guacas et al. (2023) note that using technology in teacher collaboration not only improves collaboration but also enhances the digital competence of both teachers and students. Teachers' positive attitudes toward collaboration often extend to their openness to using technology, facilitating resource sharing and communication in both physical and virtual environments (Carpenter et al., 2022).

Technology and collaboration are highly related, and many studies have indicated that technology significantly supports collaboration by enabling people to communicate, share information, and solve problems regardless of time and space (Carpenter et al., 2022). Facebook, WeChat, and Zoom are a few examples of tools that have been used to establish professional development and interaction among teachers in different countries (García-Martínez et al.,

2022; Şahin, 2023). Besides offering opportunities for feedback and sharing resources, these digital tools also enable the establishment of communities of practice that enhance teaching practice and enrich relationships among teachers (Borko & Potari, 2024). According to Liljekvist et al. (2021), Guo et al. (2022), and Delgado et al. (2021), such digital tools facilitate the establishment of stronger relationships and collaborative action among teachers in different geographical areas.

However, there are some barriers that prevent teachers from using technology in collaboration. Teachers' self-efficacy and anxiety levels in utilizing technology effectively can impact their willingness to collaborate (Maican et al., 2019). In addition, the extent to which teachers can effectively utilize digital tools in their profession may also be influenced by other variables, such as age, prior experiences, and attitudes towards technology (Šabić et al., 2021). Therefore, a further study into teachers' attitudes towards collaboration and use of technology will help us understand more about how these two variables can affect the quality and efficiency of teacher collaboration.

Although an emerging literature on collaboration and technology adoption exists worldwide, most research has focused on primary and secondary education within the Western context. Scarce attention has been given to Chinese tertiary English teachers' attitudes towards collaboration and technology use in teaching practice. This is an obvious gap in the literature that we can explore further to understand how technology supports collaboration among teachers in the Chinese university context. Similar to this, Chinese universities also faced challenges and opportunities in utilizing technology effectively in collaborative practices. It is essential to have an understanding of the attitudes of Chinese tertiary English teachers towards collaboration and technology for effective professional development and informed policy implementation.

This study attempts to bridge the above gap in the literature by exploring Chinese tertiary English teachers' attitudes towards collaboration and how technology influences their collaborative practice. By examining the interplay between attitudes and technology adoption, the research seeks to provide deeper insights into how technology can be more effectively utilized to promote collaboration among English educators in Chinese universities. The findings from this study will be useful in informing professional development and policy implementation that can support effective integration of technology use in teaching and collaborative practice at the tertiary level.

Methods

Design of the Study

To understand teachers' attitudes towards collaboration and the role that technology plays in the collaborative process in Chinese universities, this study employed a mixed-methods approach using an explanatory sequential design. Under this design, quantitative data collection was conducted first, and then qualitative data collection was carried out to strengthen the quantitative findings (Leedy & Ormrod, 2015).

The quantitative phase aimed to obtain a general picture of English teachers' attitudes toward collaboration in Chinese university context. Therefore, it focused on descriptive data, with no specific hypotheses formulated or tested. While the qualitative phase targeted at gathering detailed, context-rich insights of teachers' perspectives on technology in collaboration, hence, involving direct interaction with participants and observing their behaviour in real-world contexts (Creswell & Creswell, 2018). This combination of methods, which is particularly popular in field of social science, reflects the practical and applicable nature of mixed-methods research (Bahari, 2010).

Participants

The participants for the quantitative phase were 219 English teachers from different universities in South China. These teachers were purposefully selected from the pool of English teachers at the School of Foreign Languages. The participants' demographic and professional characteristics are as follows: 5.9% of the participants are aged 30 or younger ($n=13$), 10% are aged 31-40 ($n=22$), 64.4% fall within the 41-50 age group ($n=141$), and 19.6% are aged 51-60 ($n=43$). Regarding gender, 79% of the English teachers are female ($n=173$), while 21% are male ($n=46$). In terms of educational qualifications, 5.5% hold a bachelor's degree ($n=12$), 71.7% have a master's degree ($n=157$), and 21% possess a doctorate ($n=50$). Professionally, 4.1% are assistant English teachers ($n=9$), 73.1% are lecturers ($n=160$), 20.1% are associate professors ($n=44$), and 2.7% are professors ($n=6$). Concerning institutional affiliation, 48.8% of the participants work in Science and Engineering Universities ($n=107$), 14.6% are employed at Liberal Arts Universities ($n=32$), 32.9% work in Comprehensive Universities ($n=72$), and 3.7% are affiliated with Higher Vocational Colleges ($n=8$). Lastly, regarding teaching experience, 8.2% have 1-5 years of experience ($n=18$), 5% have taught for 6-10 years ($n=11$), 13.2% have 11-15 years of experience ($n=29$), and 73.5% have been teaching for 16 years or more ($n=161$).

The participants for the qualitative phase comprised 20 teachers who also took part in the survey. 13 of them had a master's qualification, while seven others had a doctorate.

Data collection & analysis

The quantitative data for this study was collected using the Scale of Attitude towards Professional Collaboration among Teachers (SAPCT), a 5-point Likert scale questionnaire developed by Yılmaz and Çelik (2020) to measure teachers' attitudes towards professional collaboration. The SAPCT consists of 13 items, 10 of which are positively scored, while the remaining three are negatively scored, with response options ranging from "1 - Strongly Disagree" to "5 - Strongly Agree". The items covered the "cognitive, affective and behavioural" domains, representing three dimensions of attitude. The scale demonstrated strong reliability, with a Cronbach's Alpha internal consistency coefficient of .87 in its original development (Yılmaz & Çelik, 2020). The researcher adapted the scale based on the opinions of three Chinese language professors, and a pilot study was done. The Cronbach's Alpha coefficient was then calculated at .79, indicating excellent reliability for the instrument. Preceding the scale, specific illustrations were also provided to prevent any potential misinterpretations.

The scale was adapted into an online format using Wenjuanxing, a popular survey platform in China, similar to SurveyMonkey. It was distributed electronically to English teachers across

various universities in China. The researcher explained in detail the purpose and design of the study to participants and assured them of the anonymity and confidentiality of the data collected. The qualitative data were gathered through an interview protocol. The interview questions were designed based on the research objectives and were grounded in a comprehensive literature review. The first three questions aimed at collecting information on teachers' experiences of collaboration in their profession. The remaining three questions are intended to explore the role of technology in the process of teacher collaboration. The interviews were conducted individually, via either virtual platforms or in-person meetings, subject to the availability of English teachers.

The quantitative data collected were analysed using SPSS (Version 27). It is descriptive in nature, aiming to provide an overview of teachers' attitudes towards collaboration. Both the mean scores and standard deviations were calculated. The higher mean scores indicate a more positive attitude, while lower mean scores suggest a less favourable attitude towards collaboration.

Drawing upon the work of Braun and Clarke (2021), this study employed thematic analysis for qualitative data. The interviews were audio-recorded and then transcribed to provide a comprehensive and authentic description of the collected data. To validate the study's findings, all participants in the qualitative phase were invited to read the transcripts and provide prompt feedback to ensure the research accurately reflected their experiences and perspectives.

Results

Quantitative results

The quantitative findings examine English teachers' attitudes toward professional collaboration in the context of Chinese universities, while the qualitative data delves into types of digital tools used to enhance collaboration and the impact of technology on teachers' collaborative process.

RQ 1: The Attitudes of Tertiary English Teachers toward Collaboration

The findings were reported using descriptive statistics, with mean (M) and standard deviations (SD) as shown in Table 1.

The quantitative data reveal that tertiary English teachers hold predominantly positive attitudes toward collaboration. The highest mean ratings were observed for statements that highlight the benefits of collaboration. For instance, teachers strongly agree that they are pleased to learn from others ($M = 4.35$), emphasising the value of shared learning experiences. Similarly, collaboration is seen as a means of fostering stronger bonds among teachers, as reflected in the high mean for the statement, "Collaborative activities bring teachers in this School closer to each other" ($M = 4.06$). Additionally, shared learning is highly valued, with teachers agreeing that it helps them understand the nature of learning problems ($M = 4.03$). Teachers also recognise the role of collaboration in enhancing their communication skills ($M = 4.02$).

Table 1.

Descriptive Statistics of Teachers' Attitude towards Collaboration

		n	M	S.D.
1	Collaborative activities help us understand the nature of learning.	219	3.92	0.981
2	Collaborative activities with teachers contribute to my profession.	219	3.94	0.949
3	Shared learning helps us understand the nature of learning problems.	219	4.03	0.893
4	Collaborative activities in teaching are a waste of time.	219	2.12	0.923
5	Collaborative activities make tasks more difficult.	219	2.43	0.893
6	Collaborative activities limit the creativity of teachers.	219	2.17	0.85
7	Collaboration makes me feel like a member of the School.	219	3.85	0.85
8	I am pleased to learn from others.	219	4.35	0.861
9	Collaborative activities bring teachers in this School closer to each other.	219	4.06	0.714
10	I voluntarily participate in activities that require collaboration.	219	3.76	0.8
11	Our communication skills improve when we collaborate.	219	4.02	0.751
12	Thanks to collaborative activities, we can resolve challenging conflicts more easily.	219	3.92	0.762
13	Collaboration improves the overall performance of the School.	219	3.95	0.753

On the other hand, statements reflecting negative perceptions of collaboration received the lowest mean ratings, suggesting widespread disagreement. For example, the statement, “Collaborative activities in teaching are a waste of time,” had a low mean of 2.12, indicating that teachers largely reject the idea that collaboration lacks value. Similarly, teachers disagree that collaborative activities limit creativity ($M = 2.17$) or make tasks more difficult ($M = 2.43$). These findings indicate that teachers do not perceive collaboration as a hindrance to their professional activities or creativity.

Neutral to moderately positive perceptions were observed in statements such as “Collaboration makes me feel like a member of the School” ($M = 3.85$) and “Collaboration improves the overall performance of the School” ($M = 3.95$). These ratings suggest that teachers recognize the broader institutional benefits of collaboration but may feel less strongly about these aspects compared to personal and professional growth.

The variability in responses, as indicated by standard deviations ranging from 0.714 to 0.981, suggests differing levels of agreement among teachers for certain statements. For instance, the statement “Collaborative activities help us understand the nature of learning” has a higher standard deviation ($SD = 0.981$), indicating a more diverse range of opinions. Conversely, statements such as “Collaborative activities bring teachers closer” exhibit lower variability ($SD = 0.714$), reflecting a stronger consensus among teachers.

Overall, the results indicate that teachers generally view collaboration in a positive light, particularly in its ability to foster professional development, improve communication, and strengthen community bonds. Negative attitudes, such as viewing collaboration as a waste of time or a hindrance to creativity, are strongly disagreed with, underscoring a general belief in the benefits of collaboration within the university setting.

Qualitative results

The qualitative data were collected through interviews. The analysis identified three key themes: digital tools used by teachers for collaboration, the impact of technology on the collaborative process, and the challenges faced by teachers. Several sub-themes that emerged enrich the discussion.

RQ 2: Digital Tools Being Used by Teachers to Collaborate

A range of digital tools has been identified as essential for fostering collaboration among tertiary English teachers. These tools span several sub-themes, including communication tools, video conferencing platforms, online learning environments, and AI-driven resources.

Among the twenty participants interviewed, seventy English teachers reported the frequent use of various communication tools—such as WeChat, QQ, email, and mobile phones—to facilitate collaboration. Fourteen participants indicated that they relied on video conferencing platforms to conduct virtual meetings and enable real-time interactions. This includes Tencent Meeting, Zoom, and DingTalk. Additionally, thirteen participants mentioned that they would adopt online learning and educational platforms, such as Rain Classroom and Chaoxing Learning Platform, to enhance both teaching and collaboration.

Six participants noted the integration of AI tools, particularly ChatGPT, into their collaborative practices. Moreover, five participants highlighted utilizing task management and workflow visualization tools, such as Kanban boards, Tencent Docs, Wenjuanxing (a survey platform), and various cloud storage services, to support their collaborative activities. Chinese MOOCs and platforms, such as <http://www.pigai.org/>, were also identified as valuable resources, offering comprehensive teaching and learning materials that substantially supported participants' collaborative endeavors.

RQ 3: Impact of Technology on Collaborative Process

Nearly all participants agreed that advanced modern technology has significantly enhanced collaboration among tertiary English teachers. From the data, six key sub-themes emerged: facilitating seamless communication, enhancing research and teaching processes, enabling task tracking and real-time collaboration, supporting the development of online courses, providing more opportunities for professional growth, and reducing workload while improving overall efficiency.

Facilitating seamless communication

Most participants (17 out of 20) indicated that technology has greatly enhanced communication among tertiary English teachers, promoting more efficient and consistent collaboration. Teacher Wise highlighted that technology has increased the frequency and regularity of communication, fostering stronger and more effective teamwork. Teacher Hill described technology as a driving force, enabling communication without the constraints of time and space, facilitating seamless resource sharing, and even international collaboration. Interactions occur as needed, via phone calls, WeChat, or email, with most material sharing now done online. The use of technology has widened the scope of possible collaboration and helped turn ideas discussed in collaboration into reality. As one of the respondents shared the view:

“...Without technology, it might be difficult for collaboration to happen.” (P5)

Thirteen participants confirmed that WeChat groups have become a primary platform for sharing teaching materials, including textbooks, teachers' manuals, and exam resources like CET-4 (College English Test Band 4) and CET-6 (College English Test Band 6) practice tests. Online group interactions are particularly convenient for English teachers across campuses. Additionally, electronic resources are far more efficient than traditional paper-based methods for sharing information.

Enhancing research and teaching processes

Thirteen participants emphasized that a range of digital platforms had substantially enhanced their access to teaching and learning resources, serving as integral components in facilitating effective team collaboration. For example, four participants mentioned using advanced digital tools to streamline their teaching processes. They described how ChatGPT has been instrumental in group lesson planning and highlighted the use of AI to enhance teaching methods and content delivery.

A recurring theme among participants was the value of these platforms' data capabilities for research. Teacher David highlighted how tools like Rain Classroom, Chaoxing Learning Platform, and Micro Teaching Assistant enable information sharing, data collection, and detailed feedback. These features help build student profiles, provide insights into performance, and support learning progress. The collaborative nature of these platforms also encourages the sharing of tools and techniques that might otherwise go unnoticed.

Chaoxing Learning Platform was specifically praised by a further participant, noting its evolution from a tool for tracking student attendance to a mature resource repository for teaching and research:

“...English teachers took the initiative to upload teaching materials, and soon the platform was adopted across the School of Foreign Languages. It now serves as a repository for teaching resources, supports research through data analysis, and documents teaching practices.” (P3)

Enabling task monitoring and real-time collaboration

Five participants commended the real-time capabilities of WeChat and other social media platforms for enabling prompt and efficient communication, ensuring that updates are not overlooked, and fostering “timely and synchronised collaboration.”

Teacher Shirley (P5) highlighted how various online platforms, including tools for collaborative document editing and teaching schedule management, have significantly improved instant collaboration among English teachers. For instance, real-time note-taking platforms allow team members to edit and refine documents, theses, or teaching slides simultaneously, regardless of their location. Similarly, project management tools, such as Kanban boards, help track progress, monitor task completion, and ensure that everyone's contributions are visible. This transparency not only keeps projects on track but also fosters a sense of accountability and motivation within the team. One of the teachers illustrated this further with an example:

“...When we were compiling teaching materials, each team member was assigned

specific tasks. The Kanban board made it easy to track everyone's progress. As tasks were completed, team members updated the board, ensuring we stayed aligned and met project deadlines.” (P16)

Supporting online course construction

Six participants highlighted how online learning platforms and websites have facilitated the creation of online courses. For instance, a participant emphasised that technology allows educators to create dedicated websites where exercises for students can be uploaded and shared.

Platforms like Rain Classroom and Chaoxing Learning Platform were highlighted as vital for collaborative course design. One participant explained that these platforms are essential for teamwork, as they demonstrate a teacher's commitment to the process and preparation.

The process of course development on Chaoxing Learning Platform was further elaborated by one of the participants:

“...A significant amount of time is spent creating courses on the Chaoxing Learning Platform. The goal is to design a course that follows a standard online structure, including an introduction, pre-class preparation, in-class assignments, post-class exercises, and extra materials. Each unit is standardized for consistency. In addition to textbook content, we also include knowledge from external sources. Once the course is finished, it is shared with the team through the platform.” (P15)

Providing more opportunities for professional growth

Among all the interviewed, six respondents underscored the significant role of technology in fostering collaboration and professional growth across educational contexts. For example, one participant highlighted how tools like GPT and AI for generating images and videos have enhanced material selection and expanded collaborative possibilities.

Online platforms have also provided greater opportunities for teachers to participate in training seminars. As further confirmed by a different participant, even if teachers cannot attend training seminars in person, they can still stay informed through various online channels, such as live-streamed events. She mentioned attending the Translators Association of China conference via live stream, despite not being able to attend in person.

The distinct role of technology, particularly during the COVID-19 pandemic, was also highlighted, as reflected in a teacher's remarks:

“...For example, our college occasionally invites external supervisors to support and collaborate with us. This “outsourced collaboration” allows experts to contribute remotely by conducting online classes, hosting virtual meetings, and sharing their expertise. We also have access to teaching videos from other skilled educators, which greatly enhances our learning experience” (P18)

Additionally, tools like Tencent Meeting and DingTalk were mentioned as platforms that allow teachers to showcase their teaching methods, share instructional ideas, and exchange experiences with peers both within and beyond their institutions. These platforms have greatly expanded the sharing of teaching practices, supporting professional learning and development.

Reducing the working load and improving efficiency

Six participants noted that the emergence of AI tools has greatly enhanced collaboration among tertiary English teachers by reducing workload and improving efficiency. One participant observed that technological advancements have led to more frequent online collaboration, which “saves a lot of cost and is time-efficient.”

Three participants reported that ChatGPT was considered to be a very important tool in simplifying teaching-related tasks. For instance, one instructor shared that ChatGPT has helped compile teaching materials, leading to increased team efficiency. Another teacher also confirmed the critical role of ChatGPT in handling repetitive administrative tasks, such as drafting evaluation reports for textbooks, preparing course syllabi, and formatting documents, thus making collaboration more enjoyable for everyone involved.

One more participant further stressed the importance of AI and information technology in modern teaching, noting that AI has become indispensable for making collaboration more efficient and providing valuable insights:

“...Without modern information technology, the outcomes you achieve would be vastly different. This includes everything from course materials and PowerPoint presentations to the content itself. Achieving your objectives often requires the support of tools like AI and GPT.” (P13)

RQ 4: Challenges Faced by the Teachers

Despite the important role of technology in supporting collaborative practices, several challenges persist, as highlighted by five participants. A notable concern is the high cost associated with advanced technologies such as augmented reality (AR) and virtual reality (VR), which, while offering considerable educational potential, remain limited in their adoption due to financial constraints. Age-related factors also pose difficulties in applying technology to collaboration, as explained by one of the respondents:

“...The use of new technology may require some time to learn. Young teachers tend to learn and master these new technologies more quickly. However, for older teachers, learning can be slower, and their usage may not be as frequent as that of younger teachers.” (P19)

Additionally, some teachers are resistant to adopting new technologies, slowing down the collaborative process. Teacher Peace highlighted that, despite sessions on creating micro-course videos and using ChatGPT for lesson preparation, these skills require substantial practice. Without enough hands-on experience, teachers often forget what they have learned, and time constraints make it difficult to master these tools.

Discussion

The findings indicate that tertiary English teachers generally exhibit a moderately positive attitude toward collaboration. This is consistent with previous research that highlights the growing value of a supportive attitude toward collaborative practices in educational settings

(Crandall & Christison, 2016; Bush & Grotjohann, 2020; Yilmaz, 2022). Teachers involved in this study acknowledged the valuable benefits of collaboration to both teachers and schools, such as improving communication skills, facilitating learning efficiency, resolving conflicts, and enhancing overall school performance. Such benefits are also highlighted by Rigney et al. (2021), who claim that collaboration contributes to the professional growth of teachers, and by Vangrieken et al. (2015), who emphasize the positive effect of collaboration on improving job satisfaction and reducing teacher attrition rates by fostering a strong sense of community.

However, the variation in the responses indicated that collaboration was not beneficial for all teachers. Although most teachers believed that collaboration enhances professional development, some still expressed doubts about its benefits and were unwilling to work collaboratively with their colleagues. This finding has been corroborated by the findings of Liu and Xiu (2019), who argued that teachers were not sufficiently aware or motivated to collaborate. This finding also indicated that collaboration did not benefit all teachers equally. Its effects may depend on other factors such as attitudes, interpersonal relationships, institutional culture, and perceived barriers.

The findings of this study can be further interpreted through the lens of TPB, which assumes that behavior is influenced by three components: attitudes, subjective norms, and perceived behavioral control (Ajzen, 1985; Ajzen & Driver, 1992). The teachers' generally positive attitudes towards collaboration, which are reflected in the high mean scores of statements such as "I am pleased to learn from others" and "Collaborative activities bring teachers closer", correspond to the attitudinal component of TPB, which indicates favorable dispositions towards collaborative teaching. Subjective norms are evident in teachers' references to their peers' expectations and the institutional values that promote a teamwork spirit, especially through the use of WeChat or Chaoxing Learning Platform, which creates shared norms regarding collaborative practices (Mok & Jain, 2023). Perceived behavioral control is reflected in both the facilitators and barriers extracted from the qualitative data: many participants felt empowered by the digital tools to collaborate efficiently, while others, especially elder educators, expressed hesitance due to lack of digital technology proficiency, time constraints, or confidence (Mok & Jain, 2023). The findings support the TPB proposition that even if attitudes and social norms are favorable towards a behaviour, collaboration may still be hindered if individuals feel they have low control over their ability to act. Therefore, TPB is helpful for not only explaining the variation in teachers' willingness to collaborate but also understanding how technological competence and institutional support may enhance or hinder collaborative intentions and actions.

With the gradual decrease in in-person interactions, online platforms such as WeChat, video conferencing tools, and other learning platforms have become the focus of teachers' collaborative efforts. This is in line with the findings of García-Martínez et al. (2022), Şahin (2023), and Zuo et al. (2025), who also found the increasing use of digital tools in teachers' collaborations in different parts of the world. The growing popularity of the Chaoxing Learning Platform and Rain Classroom among teachers, which have evolved from auxiliary tools to become an integral part of daily teaching practices, was also observed in this study. These findings suggest that digital learning platforms have significant potential to enhance both

teaching and learning. They offer teachers greater accessibility to teaching and more possibilities to conduct research (Mok & Jain, 2023).

As stated by Delgado et al. (2021), with the growing integration of technology in educational settings, it will be possible to establish sustainable communities of practice that will contribute to the long-term professional development of teachers and learning. Likewise, this study confirms that the advancement of technologies has allowed teachers to reduce their workload, save time, be more efficient in classes, and even create more harmonious collegial relationships, which in turn influence teachers' perceptions of professionalism and increase their self-confidence, making them feel more settled mentally. These results align with the positive findings reported in previous studies (Liljekvist et al., 2021; Nguyen et al., 2023), which demonstrate that technology not only facilitates collaboration but also promotes learning. Tools that enable fast feedback and the development of common resources facilitate the sharing of teaching practices, encouraging innovation in teaching and ultimately leading to the establishment of communities of practice among teachers (Borko & Potari, 2024).

Although there are many benefits of technology, tertiary English teachers encounter many difficulties when they try to use technology in collaboration. Among them, high costs, age, technological reluctance and incompetence, insufficient time, and limited opportunities for practice stood out. While previous studies (Maican et al., 2019; Šabić et al., 2021) identified technological reluctance and competence as the issues that hinder technology use in collaboration, this study has made a new contribution by identifying high costs and a lack of chances for practical technology application as barriers to integrating digital tools effectively.

Furthermore, teachers' inability to apply technology in their profession not only hinders their efforts to be fully involved in co-teaching and other collaboration activities, but also undermines their confidence to control the class efficiently (Carpenter et al., 2022). As suggested by TPB, teachers' perceived ease of using technology to collaborate affects their self-efficacy to implement collaborative practices (Ajzen, 1985), which in turn shapes their attitudes towards collaboration (Mena-Guacas et al., 2023). When teachers feel unprepared or not competent enough, they are less likely to carry out collaborative strategies successfully (Guo et al., 2022), necessitating ongoing support and training to bridge the gap between technological advancements and effective collaborative practices.

While many of the findings in this study reinforce existing literature—such as the link between positive attitudes and collaborative engagement (Drossel et al., 2019; Yilmaz, 2022), or the role of technology in enhancing communication and peer support (Carpenter et al., 2022) this study offers several novel contributions that expand current understanding. First, it adds contextual specificity by examining how tertiary English teachers in Chinese universities uniquely leverage local digital tools such as Chaoxing Learning Platform and Rain Classroom, which are rarely discussed in the international literature. Second, this study captures an emerging trend: the integration of AI tools like ChatGPT into collaborative teaching activities, a development not yet widely reported in empirical studies of teacher collaboration. Third, it surfaces underexplored barriers to collaboration, including financial constraints related to AR/VR adoption and the time-intensive nature of mastering new digital platforms. These insights contribute original evidence to the growing field of technology-mediated teacher collaboration.

Finally, through analysing both attitudinal and technological factors that shape collaborative behaviours from perspectives of TPB, this study offers a comprehensive theoretical framework that opens new avenues for future research and professional development programs in similar tertiary EFL contexts.

Implications, limitations, and recommendations

The findings of this study indicate that university EFL teachers generally hold a positive attitude toward collaboration. Most acknowledge its importance in teaching and actively participate in team-based activities. However, those with less favorable attitudes often exhibit resistance or passive involvement, highlighting the critical role that teachers' attitudes play in determining the extent of their engagement in collaborative practices. Therefore, it is crucial for teachers to consciously cultivate a positive attitude towards collaboration in order to engage in deeper and more effective participation. At the same time, educational stakeholders and policymakers should take positive actions to create an environment to support a collaborative culture and promote meaningful collaboration.

The study further indicates the important role that technology and various digital tools play in the process of collaboration. It could help teachers overcome the traditional limitations of time and space, and make their communication more convenient, interactive, and efficient. To better incorporate these digital tools into professional development programs for teachers, it's of paramount importance for relevant institutions to increase investment and update the digital infrastructure in universities. In particular, the transition from traditional face-to-face collaboration to online collaboration among Chinese tertiary English teachers, found in this study, also requires more effective support for virtual collaboration.

However, Chinese tertiary English teachers, especially the elder ones, still encounter challenges in adopting and effectively employing technology to collaborate. These persistent barriers urge targeted and effective interventions to support meaningful collaboration among teachers. More financial support shall be provided and diversified training programs shall be launched to enhance teachers' digital competence and promote broader acceptance and applications of technology in their procession. Such initiatives contribute to the smooth integration of technology into collaboration, eventually leading to enhanced teaching quality and improved learning outcomes.

Although this study employed a mixed-method approach, the analysis for the quantitative phase is limited to descriptive statistics. Future researchers could delve deeper to incorporate inferential statistical methods, such as t-tests or ANOVA, to examine whether attitudes differ significantly across demographic characteristics such as gender, years of teaching experience, or professional titles. This would provide deeper insights into the factors that influence teachers' attitudes towards collaboration. Moreover, although various digital tools have been utilised to facilitate collaboration, it remains unclear which tools are most effective in enhancing collaborative efforts. Future research could compare different tools to identify those that are most suitable for fostering collaboration, particularly in the context of language education.

Conclusion

This study specifically explores the attitudes of English teachers towards collaboration in Chinese university contexts and the role of technology in the collaborative process. Tertiary English teachers generally hold a positive attitude toward collaboration; however, not all fully recognize its benefits in daily teaching practice. This highlights the need for ongoing efforts to enhance teachers' awareness of collaboration and develop a sense of appreciation for collaboration. Various digital tools, covering communication tools, video conferencing platforms, online learning and educational platforms, AI tools, particularly ChatGPT, and websites, have been adopted by tertiary English teachers to facilitate interactions and sharing, contributing to the efficiency of learning and teaching.

However, despite the pivotal role of technology in facilitating collaboration, its effective integration remains impeded by several challenges, including high costs, age-related barriers, resistance to change among teachers, practical application obstacles, and time constraints. This necessitates targeted interventions by relevant educational stakeholders to cultivate a collaborative environment that encourages active teacher participation and harnesses the potential of technology to promote effective collaboration.

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