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Technical Report

Co-creating blended teaching activities using AI in TESOL contexts: Report of an online Change Laboratory pilot study

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Abstract: This report details a pilot study designed to inform a larger Ph.D. project that explores the integration of artificial intelligence (AI) in TESOL contexts, specifically within blended learning environments for adult learners in China. The study was structured around four online Change Laboratory (CL) workshops held in 2024 and focused on how teaching staff—comprising one tutor and six TESOL teachers—adapt AI technologies in their work. These participants, drawn from online education companies, engage with AI for teaching, student management, and administrative tasks.

The primary aim of this pilot study was to evaluate the design and execution of cross-cultural, participatory workshops, using the Change Laboratory methodology, and to derive actionable insights for refining both the Ph.D. project's methodology and future interventions. One of the key findings highlighted the influence of cultural and linguistic diversity among participants, which presented unique opportunities and challenges in fostering active participation and co-creation of AI-integrated teaching practices.

Keywords: Online Change Laboratory; Generative AI; TESOL; Project report.

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1. Introduction

The rapid integration of educational technologies, especially artificial intelligence (AI), is transforming teaching practices in language education. Teachers today are expected not only to use these AI tools but also to work collaboratively in AI-enhanced environments to improve instructional practices (Van Leeuwen & Rummel, 2020). However, this technological transformation often occurs through a top-down approach, led by institutional leaders, which creates a gap between the AI tool designers and the teachers who actually implement them (Lawrence et al., 2024; Wang et al., 2023). This gap can lead to misalignment between the tools' intended use and their practical application in teaching, diminishing the effectiveness of AI in education.

This Ph.D. project is rooted in the idea of empowering teachers to take an active role in integrating AI tools into their practice. By fostering a bottom-up approach to technology adoption, this research aims to support innovation and collective agency among teaching staff. The motivation for this study stems from the researcher's extensive experience in the TESOL field, both as a teacher and as a researcher in educational technology. Since 2017, the researcher has worked as a part-time English teacher in China, using AI-driven systems like intelligent tutoring systems (ITS) to enhance student learning.

Initial research, conducted during the researcher's master's dissertation in 2019, highlighted varied levels of TESOL teacher engagement with AI tools in China, raising important questions about how these tools are designed and how teacher agency affects their adoption. The COVID-19 pandemic accelerated the adoption of AI in education, further highlighting both the opportunities and challenges of using AI-driven systems such as natural language processing (NLP) pronunciation aids and AI-generated personalized feedback tools. The researcher's experiences as a teacher trainer, and product manager in private online English education companies over the past five years have provided a unique perspective on how AI can be used to support teaching, as well as insight into the barriers that prevent effective AI integration.

In online educational companies in China, where the pilot study took place, AI tools are deployed in various forms to create blended English learning experiences for adult learners. These companies, despite differing in how they design and use AI-based tools, share a common thread—inter-professional and collaborative teamwork. Based on the researcher's work experience in several online educational companies, the development of these tools involves a wide range of stakeholders and an elaborate division of labour. Product managers analyse student and stakeholder needs, content teams create the teaching materials embedded in the tools, while tech teams and designers work on the functionality and user experience. Teaching professionals offer insights into how the tools interface with users, particularly how they mediate interactions between teachers and students. In addition, other stakeholders such as tutors, sales teams, and managers also participate in co-designing these AI tools. After the product is developed, both teachers and tutors could use the tools for higher work efficiency, personalised teaching suggestions and materials. Meanwhile, IT team and training teams prepare teachers and tutors on how to use the tools in their daily work and teaching. Managers and sales teams also rely on AI tools to track student engagement, forecast renewals, and address complaints, making AI an integral part of these organizations' operations.

While this cross-departmental collaboration is aimed at fulfilling the needs of various stakeholders, some literature and the researcher's experience working in these companies reveals that the collaboration between stakeholders is constrained and often gives way to hierarchy, leading to tools biased and incompetent in nature (cf. Luckin et al., 2022). In many cases, the needs of teaching staff are deprioritized or ignored, leading to misalignments between the

intended use of the tools and actual teaching practices. As a result, teachers may use AI tools differently from what was expected, which can negatively impact teaching and learning outcomes (Felix, 2020). Therefore, to improve the readiness of teaching staff to adopt and effectively use AI, they require cross-departmental and institutional support in terms of resources, knowledge, and cultural alignment (Jöhnk et al., 2021). Furthermore, active participation in the design and implementation process is essential to ensure that the tools meet the practical needs of teaching staff (Wang et al., 2023; Holstein et al., 2019), calling for a bottom-up, exploratory intervention.

The research took place in two online educational companies in China that specialize in providing blended English learning experience for adult learners, using a range of AI tools to support flexible learning. Both companies are industry-leading companies in China with thousands of customers choosing them for improving their English communicative abilities for work or life. The service includes mainly a large amount of self-learning materials and practices, one-on-one speaking lessons, group lessons, and personalised tutoring by a tutor who checks students' learning progress and answers questions. The pilot study focuses specifically on the exploratory experiences of TESOL teachers and tutors—critical actors in the successful adoption of AI technologies. Teachers, aided by intelligent tutoring systems (ITS), access data-driven insights into student progress and adapt teaching materials with the help of AI chatbots to meet individual learner needs. ITSs can help tutors as well by flagging students making inadequate progress, who can be followed up by tutors. The major difference between these two roles is that teachers' schedules are filled with private or group lessons, while tutors don't teach lessons, but primarily provide timely help whenever students have questions. Tutors are integral in bridging the gap between learners and teachers, making their role in the study crucial for collecting mirror data that reflects the real-life complexities of using AI in online adult TESOL.

Much existing research typically evaluates the effectiveness of AI tools that have been designed by researchers and or administrators, and practices that are already in place (discussed in Felix, 2020). Not much focus is given to how these were developed in the first place. This pilot study, a preparatory step for a larger Ph.D. project, addresses a critical gap by examining practitioners' perspectives and their role in the co-construction of AI-based teaching practices. The broader Ph.D. research aims to explore inter-professional collaboration and the role of AI tools in these online educational settings, where multiple stakeholders, including teachers, tutors, and administrators, use AI for both pedagogical and operational purposes. However, the researcher was uncertain about some aspects of the project. Firstly, the researcher did not have experience on conducting Change Laboratory (CL) workshops, whose work time is difficult to estimate (Virkkunen & Newnham, 2013), which will be discussed in detail later, and knew that the online CL workshops might prove to be challenging and different to the offline ones (Obexer, 2024). Secondly, there was limited literature on bottom-up educational collaboration among participants from different cultural backgrounds and who speak different languages, especially with Chinese participants. To address the above challenges, the researcher decided to do a pilot study project to generate data which would help in the main workshops later.

A key objective of the pilot study was to examine how cross-linguistic and cross-cultural factors might impact online Change Laboratory workshops about the use of AI in TESOL. The participants included a tutor and six TESOL teachers, some of whom were native Mandarin speakers working in China, while others were native English speakers working from Johannesburg, South Africa. The study aimed to investigate how these groups, who share similar roles but come from different cultural backgrounds, reflect on their teaching practices, identify areas for improvement, and propose new work practices involving AI technologies. The pilot sought

to understand how cultural and linguistic diversity can create both opportunities and challenges in Change Laboratory collaboration, which will be a significant factor in the researcher's larger Ph.D. project.

The pilot study employed the Change Laboratory method, grounded in Cultural-Historical Activity Theory (CHAT), to foster participatory change through the collaborative reconfiguration of work practices. The Change Laboratory provides a framework for understanding and resolving contradictions in professional practices, enabling participants to develop new work methods through expansive learning cycles (Engeström, 1987/2015). The pilot was designed to test this methodology in an online TESOL context, engaging participants in four workshops over three months to identify challenges in their current use of AI tools and collaboratively model solutions.

The findings from this pilot study are expected to inform the researcher's larger Change Laboratory project, which aims to enhance the active and meaningful participation of educators in AI adoption. The pilot study provided insights into selecting appropriate mirror data, designing effective stimuli for collaboration, and refining the researcher's intervention skills. By addressing these practical aspects of participatory research and focusing on the cultural and linguistic factors that shape teacher collaboration, this study offers critical recommendations for future Change Laboratory initiatives in TESOL.

2. Methodology

This section provides an overview of the research methodology used in this pilot study, starting with brief introductions to key theoretical concepts, followed by detailed descriptions of the research site, how the study was conceived, the participants involved, and the processes of collecting mirror data, conducting tasks, and implementing Change Laboratory (CL) workshops.

2.1 Theoretical concepts

Several texts elaborate on the theoretical underpinnings in more detail than is possible here (Virkkunen & Newnham, 2013; Bligh & Flood, 2015). The foundational concepts include activity systems, expansive learning, and transformative agency by double stimulation.

This pilot study was framed as an exploratory experiment for the researcher's larger PhD research project, which is designed to experience the entire expansive learning cycle—a cyclical movement between actions through which people develop culturally innovative ideas, practices, and artifacts. The workshops in this pilot study were grounded in the first three stages of expansive learning (Engeström, 1987/2015), aimed at:

- Questioning accepted practices: Participants examined and critically questioned current teaching practices.
- Analysing the situation: They conducted both historical and empirical analyses of their teaching and working contexts.
- Modelling new approaches: Participants proposed new models and potential solutions for integrating AI into their teaching practices.

Transformative agency by double stimulation focuses on how disparate groups of people can be forged into transformative coalitions (Sannino, 2015). Double stimulation, a Vygotskyan principle, involves researchers collaborating with research subjects using specifically designed tasks

(second stimuli) to help them overcome conflicting motives and change their circumstances (first stimuli).

Grounded in both Activity Theory and Expansive Learning frameworks, this study used the Activity System Model (Engeström, 1987/2015) (see Figure 1) to analyse systemic contradictions that emerge in the online TESOL teaching practices with AI-based tools. The Activity System Model helps illuminate how individual activities (e.g., teaching) are shaped by interacting components—such as the subject (e.g., teachers), community (e.g., students and institutional stakeholders), mediating tools (e.g., technology), and the division of labour (e.g., teachers and tutors)—and the rules governing these interactions. Through the Change Laboratory (CL) workshops, participants engaged in the first stages of expansive learning: questioning current practices, analysing systemic contradictions, and modelling new solutions.

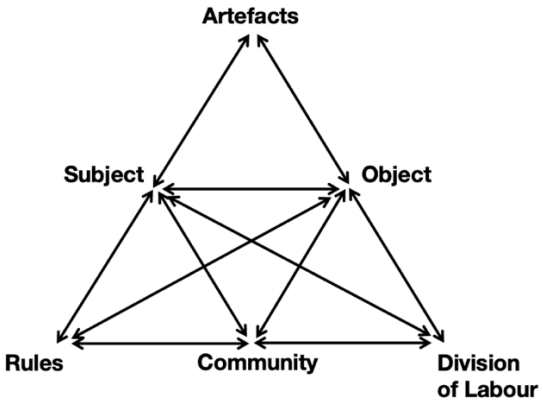


Figure 1. The Activity System Model (Engeström, 1987/2015).

2.2 The research site

The selection of an ideal intervention unit is crucial when implementing the CL approach. Virkkunen and Newnham (2013) recommend choosing a local unit where there is strong recognition of the need for change, a strategic organizational position in the industry, the capability to work with research-interventionists, and sufficient stability. However, for those working in online education settings, there may be limited options due to the scarcity of companies using AI-based technologies in teaching and learning processes, and the limited research conducted by insider-researchers in these contexts.

The research site for this pilot study consisted of two leading educational companies in China, both of which provide online blended TESOL learning experiences to millions of adult learners since 2018. These sites were chosen because they had designed and implemented AI-based educational and administrative tools, and the workflow between departments was well-established in the industry. A strong interest in cross-professional collaboration was already evident within these companies. Additionally, the researcher has worked at both companies as a member of the academic staff involved in teacher training, granting access to both staff and management. Furthermore, some members of the management team had expressed a prior interest in innovation, creating an encouraging environment for exploring a more integrated approach to empowering both teaching and learning.

2.3 Conceiving the study

Local challenges in online TESOL teaching with AI-based tools were identified by both the teaching staff and the researcher, who were experiencing these challenges within the same context. Externally, some students enrolled in advanced AI-assisted English learning courses had expressed dissatisfaction on social media, complaining that they made little progress in the blended learning mode that combined both human teaching staff and AI tools.

Prior to this pilot study, there had been small initiatives from both teaching staff and management to voice frustrations about teaching and working in AI-supported settings, such as weekly small group meetings. However, there were few plans from management to implement interdepartmental or cross-departmental actions to address teachers' concerns. Consequently, constructive proposals from teachers were not having the desired impact on the institutions or students. This scenario aligns with observations made by Lawrence et al. (2024) and Wang et al. (2023), as discussed in the Introduction, that the isolation of teaching staff in local contexts is a common issue with significant negative consequences.

2.4 Recruiting participants

Participant recruitment followed the criteria outlined by Virkkunen and Newnham (2013). These criteria emphasize that participants must engage with the same object in their daily work and be involved in achieving the same final outcomes, despite differences in occupation, task, or hierarchical position. The group composition is also crucial for facilitating open and direct discussion among participants about practice problems and opportunities for change.

Table 1. Participants Information.

	Tutor Participants	Participants of Session 1M & 2M	Participants of Session 1E & 2E
Number	1	4	2
Name	A	B1, B2, B3, B4	C1, C2
Nationality	Chinese	Chinese	The Republic of South Africa
Mother Tongue	Chinese	Chinese	English
Employee Type	full time	1 full time + 3 part time	part time

For this pilot study, participants were recruited from the teaching staff of the two companies. Since the researcher has worked for both companies, recruitment was conducted through direct contact, with an emphasis on staff who had:

1. Worked with AI-based tools in the companies for more than six months,
2. Taught TESOL courses to Chinese adult learners for over six months, and
3. Shown an interest in innovations in teaching practice in the digital era.

Seven teaching staff participated in this pilot study—six teachers and one tutor (see Table 1). The group included full-time and part-time employees of the two companies, who were actively engaged in the use of AI for either teaching or administrative purposes. The participants represented diverse backgrounds: one tutor (A) and four TESOL teachers (B1, B2, B3, B4) were native

Chinese speakers residing in different cities in China. And two TESOL teachers (C1, C2) were native English speakers from Johannesburg, South Africa. This diversity allowed for a cross-cultural examination of how AI tools were integrated into educational practices.

In order to account for potential linguistic and cultural differences that might affect participation in discussions, the six teacher participants were divided into two groups based on their first language. Both groups experienced the same process and were assigned identical tasks and materials. The researcher, fluent in both English and Mandarin, repeated the sessions twice—once in English (Sessions 1E and 2E) and once in Mandarin (Sessions 1M and 2M).

2.5 Mirror data generation

Mirror data plays a critical role in Change Laboratory (CL) interventions as it provides participants with materials that help them reflect on their practice problems and systemic contradictions. For this pilot study, the researcher followed the general principles outlined by Virkkunen and Newnham (2013) in focusing mirror data on specific practice challenges, exemplary cases, and routine actions that would provoke reflection and discussions in CL workshops.

Given the nature of online education and the adoption of AI-based tools, gathering mirror data directly from classroom practices or observations was restricted by institutional privacy policies. To overcome this limitation, the researcher opted to collect data from other sources, such as student feedback posted on social media and semi-structured interviews with tutors.

The first type of mirror data collected consisted of anonymized student feedback posted on Chinese social media platforms where users shared personal experiences of using the products bought from the two given companies, including their frustrations and achievements in AI-assisted English learning. These comments, gathered from posts made after 2019, are routinely collected by the companies and summarised as reports for customer need analysis, thus available to the researcher. They offered a direct window into students' perspectives on blended learning. While these posts were in Mandarin, the researcher translated them into English to ensure that non-Chinese-speaking participants could engage with the content (See Figure 2). Though initially the researcher intended to use class recordings as mirror data, privacy issues precluded their use, leading to the decision to incorporate student comments instead.

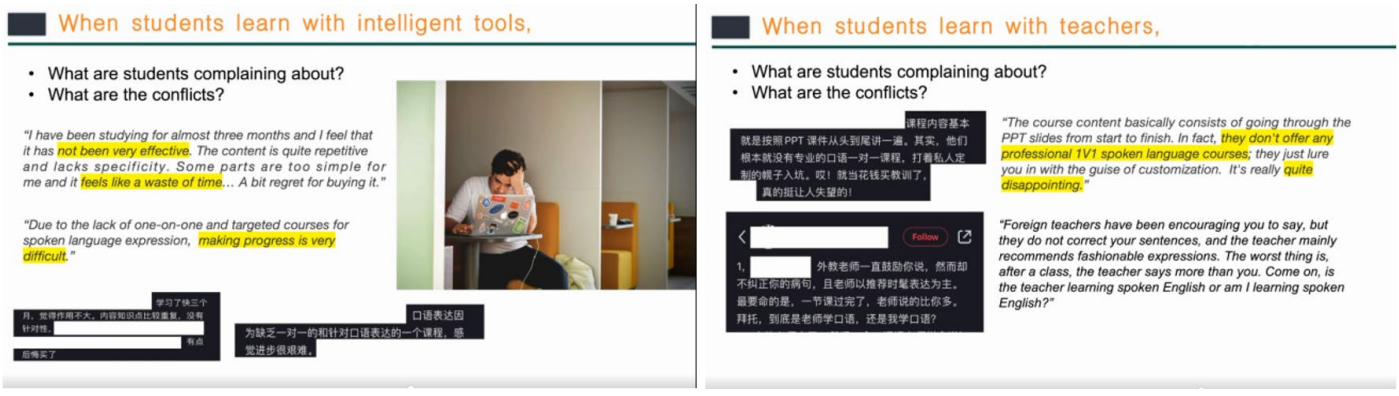


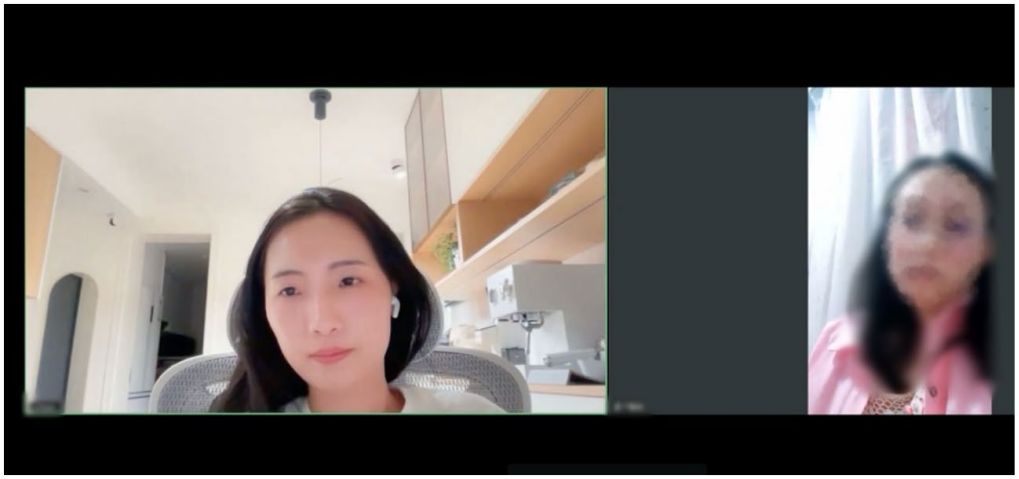
Figure 2. Mirror data: students' comments.

The second type of mirror data was collected via a semi-structured interview with a tutor. As explained above, tutors don't teach, but mainly follow the students closely by checking their learning process and providing timely help whenever they have questions. Tutors fill the gap between learners and teachers whose schedule is filled with lessons, and thus have the most

direct and comprehensive reflects on the real-life complexities of using AI in online adult TESOL. This interview, conducted in May 2024, focused on the tutor's perspective regarding the use of AI tools, including the challenges, conflicts, and tensions encountered in her daily work (see Figure 3). The outline of the interview was shared with the tutor in advance to allow for adequate preparation, and the interview itself was recorded for analysis. Based on the tutor's responses, an activity system model was developed to visualize the relationships between different components of her activity and the systemic contradictions she experienced. This model, alongside selected interview clips, was used as mirror data in the workshops to stimulate participants' reflections and discussions.

The interview with the tutor is designed to be semi-structed and recorded in order to be produced clips and an activity system model of tutor's view as mirror data to be used in formal CL sessions. The tutor interview was conducted online in May 2024 and lasted for about one hour. The outline of the interview was sent to the tutor two days before the interview for her to make preparation. The question design was underpinned by the activity system model, starting with the objectives of her activity, covering the conflicts/difficulties that she experienced and or observed, and the relations between the factors which leading to the conflicts. Then after the interview, the researcher completed the activity system model based on the answers of the tutor.

By combining multi-voiced data from both students (online feedback collected by the company) and tutors (interview), the researcher aimed to create a richer, more comprehensive picture of the systemic challenges faced by those engaged in AI-enhanced TESOL teaching.



Interview Question Guides

With: tutors who serve students and answer their questions online

Subject: Co-creating blended teaching activities using AI in TESOL contexts: A Change Laboratory pilot study

1. Job duties
   a. describe the students that you serve
   b. describe the team members that you work with
   c. describe a normal work day
   d. describe intelligent technology adoption in your work and students' learning
2. Problems in the workplace
   a. describe the problems and or frustrations that students reported on learning process or effects
   b. describe the problems and or frustrations that you experienced when you cooperate with other team members
   c. describe the problems and or frustrations that you experienced with artificial intelligence-based tools
   d. describe the problems and or frustrations that other team members reported to you in their work
3. Achievements in work
   a. describe your achievements
   b. analyse the factors that contributes to the achievements
4. Reflection and insights
   a. why do the problems occur?
   b. why some stakeholders tell and others do not?
   c. what are your efforts on solving these problems?
   d. how could the problems be solved?

Figure 3. Mirror data: interview with the tutor and the outline.

2.6 Designing workshops

The design of the workshops for this pilot study followed the Change Laboratory (CL) methodology as laid out by Virkkunen and Newnham (2013), focusing on expansive learning actions. The workshops were intended to support participants as they moved through the expansive learning cycle, which is a core feature of CL interventions. Typically, CL processes involve five to twelve sessions of around two hours each, guiding participants to question current practices, analyse them, and model new approaches to address identified problems.

In this pilot study, the researcher designed an outline of four CL sessions under to guidelines of Bligh (2023), focusing on the first two steps of expansive learning (see Table 2), questioning current practices and analysing their historical and systemic causes. The workshops were

intentionally kept shorter than the traditional two-hour sessions, with each session lasting one hour. This adjustment was made in response to participant preferences and the pilot nature of the study, recognizing that the absence of managerial involvement and institutional commitment limited the scope of participation. Nonetheless, the sessions were structured to ensure meaningful engagement with the core principles of expansive learning and double stimulation.

The tasks designed for each workshop were grounded in Vygotskyan principles of dual stimulation (see Table 3), wherein the first stimulus (a problem) was presented, followed by a second stimulus (a tool or conceptual framework) to support participants in resolving the identified issues. For example, in the first session, participants were asked to reflect on their current teaching practices with AI tools (first stimulus) and were then introduced to the concept of systemic contradictions (second stimulus) to guide their analysis. To present problems and contradictions better and stimulate reflection, mirror data are used, like the comments from students on their learning experience, and the video clips of the interview with the tutor.

The overall design of the workshops followed these key steps:

1. **Session 1M & 1E**: The first session focused on questioning accepted practices. Participants were encouraged to reflect on their experiences using AI tools in TESOL teaching and to identify contradictions or problems they had encountered. The session began with introductions to establish rapport, followed by a task that asked participants to define "contradictions" in their teaching practices. Mirror data from student feedback was used to provoke discussion.
2. **Session 2M & 2E**: This session moved from questioning to analysis. Participants were asked to conduct historical and empirical analyses of their teaching practices. The session focused on exploring the roots of the contradictions identified in the first session, including historical developments and systemic factors that shaped current practices. The tutor interview and activity system model were introduced as mirror data to support this analysis.

Although the researcher did not anticipate that participants would continue beyond the analysis phase, the second workshop organically shifted towards modelling new solutions, as participants began to propose changes to their teaching practices based on their reflections. This unplanned shift highlights the fluid nature of CL interventions, where participant agency and the evolving dynamics of the group influence the direction of the sessions.

After each session, the researcher reviewed the recordings and prepared notes and an agenda for the following session, using the expansive learning to support strategic thinking about the ongoing direction of the project. The researcher then sent the agenda, and any additional material needed for the next session to all participants.

While these workshops were designed with the intention of fostering expansive learning, the pilot nature of the study meant that the aim was not to complete the full cycle. However, the sessions successfully initiated the first steps of the process, providing valuable insights into how AI tools could be integrated into TESOL contexts.

Table 2. Actions of the expansive learning cycle mapped onto the CL research workshop.

Mapping the stages of the expansive learning cycle to the sessions		
Description of planned stage and initial design intention	**Session number, dates and intervals**	**Actual focus of action when judged against the expansive learning cycle**
Type 1 Questioning: people reject established wisdom, current practices, and existing plans;	**Session 1E & 1M**	Type 1: Questioning and criticizing (Planned and Actual)
Type 2 Analysis: people investigate and represent the structure and history of the present situation.	**Session 2E & 2M**	Type 2: Analysis (Planned and Actual) Type 3: Modelling (Actual)

Table 3. Summary of Change Laboratory session design.

Session Info	Stage of the ELC	First Stimulus	Second Stimulus	Mirror data
Session 1E 4 participants **Session 1M** 2 participants	Questioning	Identify the problem in teaching and working	Concepts such as disturbance or conflicts	Comments from students on teaching Audio clips of interview with the tutor
Session 2E 4 participants **Session 2M** 2 participants	Analysis: Historical	Map how the object of activity has changes over time, identify which other activity system elements have changed and when	Activity system model	Timelines of how technologies were adopted in TESOL (post-task after workshop 1)
	Analysis: Actual-empirical	Identify elements that contribute to the problem	Activity system model Concepts such as disturbance or conflicts Cycle of expansive transformation	Past research findings on teaching and working with AI-based tools online The activity diagram from a tutor's view

2.7 Implementing the workshops and analysis

The implementation of the workshops was facilitated using online tools to accommodate participants' geographic dispersion across China and South Africa. All sessions were conducted via VooV, a cloud conferencing platform commonly used in China (Figure 4) which is similar to Zoom, with collaborative tasks carried out using Miro (Figure 5), an interactive whiteboard tool that enables participants to collaborate visually with workshop materials. People can be invited to the same Miro page and add texts freely under the guidance of the researcher.

Workshops were recorded for later analysis, and participants' interactions—both spoken and in the chat box—were documented to capture the full range of insights generated during the sessions. Additionally, Miro boards were saved after each session to preserve the outputs from collaborative tasks, including diagrams, notes, and group reflections. These artifacts formed an integral part of the post-intervention analysis.

Figure 4. Screenshots of Workshop 1M & 1E on VooV.

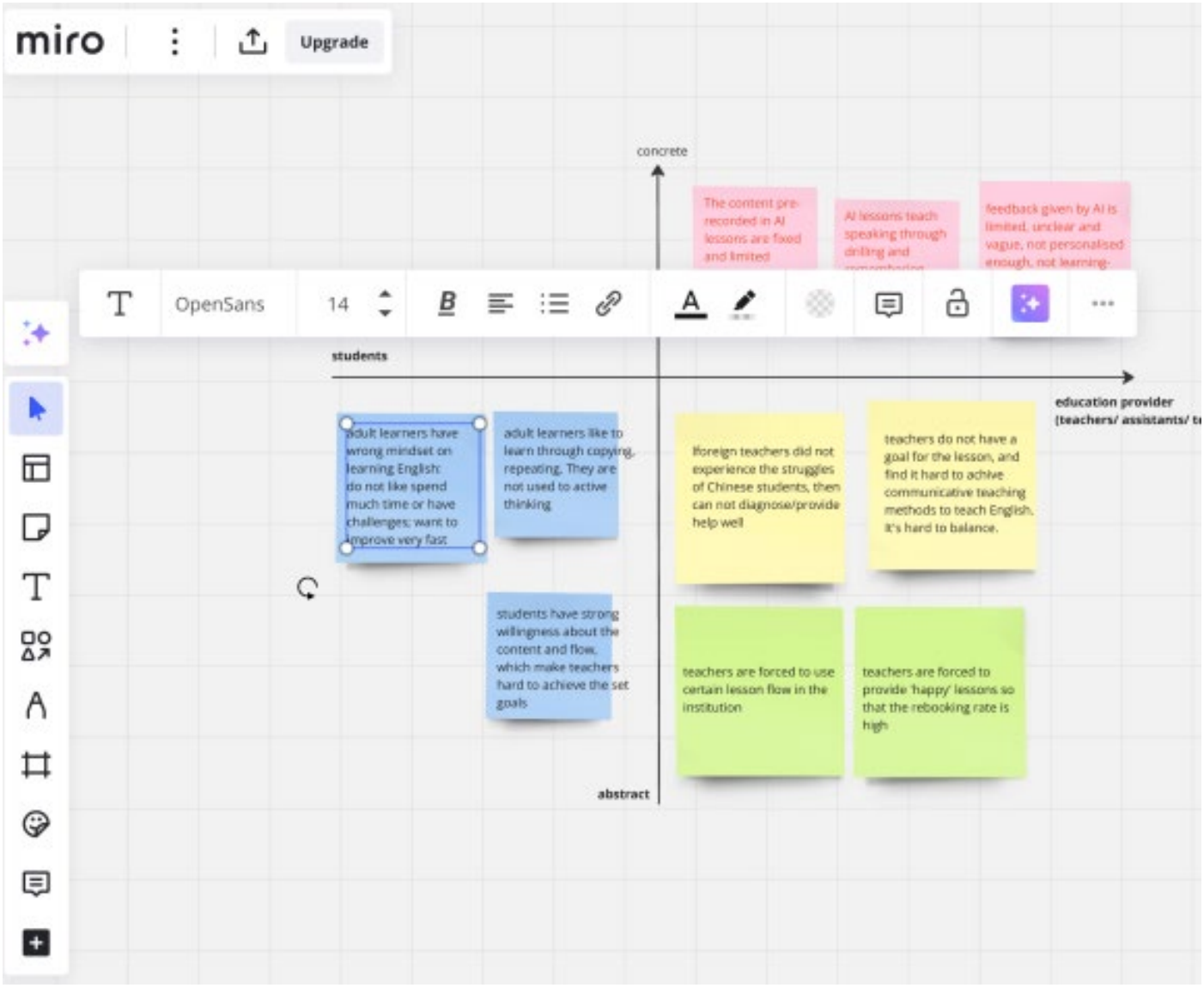


Figure 5. Screenshot of Miro Platform.

The data generated from the workshops were analysed at multiple stages as presented by Scahill and Bligh (2022):

- Within-session analysis: This involved real-time, collaborative data analysis during the sessions, where participants generated new insights in tandem with examining existing data. This ongoing process, referred to as intersession analysis, allowed for continuous knowledge production.
- Between-session analysis: This focused on reviewing session recordings and notes immediately afterward, evaluating participant engagement, discussion quality, and progress on identifying contradictions and proposing solutions. This analysis informed the preparation of subsequent session agendas and materials.
- Post-intervention analysis: This involved a more detailed review of the recordings, transcripts, and collaborative artifacts after the conclusion of all four sessions. The focus of this analysis was on identifying key themes related to teacher engagement with AI tools, systemic contradictions, and expressions of transformative agency.

The post-intervention analysis was guided by three key questions:

1. How were participants able to address the different expansive learning actions in relation to the integration of AI tools in TESOL teaching?
2. What aspects of the workshop influenced participants' readiness to engage actively in the CL process?

Selected episodes from the workshop recordings, along with the translated transcripts, were reviewed multiple times to identify moments where participants demonstrated transformative agency, such as when they shifted from identifying problems to proposing solutions. This analysis forms the basis of the findings presented in the next section.

3. Findings

In this section, the findings are framed through the lens of Engeström's expansive learning framework. The focus is on how the participants reflected on their work and defined problems, how they collectively identified and analysed contradictions, and how they started modelling spontaneously. These actions reflect the broader cyclical process of expansive learning, which encourages participants to critically analyse their practices, reflect on the past, and create innovative solutions through collaboration and experimentation.

3.1 Questioning

The process of questioning serves as the first step in expansive learning, where participants begin by identifying problems or contradictions in their current practice. This phase was initiated by the researcher presenting comments from students regarding their real English learning experiences with teachers alone, AI-based products alone, and the blended mode (involving both teachers and AI-based tools). These comments framed new questions that challenged existing assumptions and opened possibilities for development. Subsequently, the participants and the researcher raised questions about the factors that lead to inadequate learning experiences, particularly focusing on the adoption and application of new technology. This became the starting point for collective learning.

At the beginning of the questioning action, participants in both 1M and 1E actively and critically joined the discussion, comparing the AI-based English learning products and teacher-led instruction. They criticized the drilling teaching methods and ineffective error correction

features of NLP-based English learning products while highlighting the strengths of teachers in providing adaptive teaching content and formative assessments throughout the learning process. Interestingly, they also noted that adaptive teaching by teachers is constrained, as "in our company, teachers are provided with a set of teaching content with clearly defined patterns or flows, which we are required to follow." However, when it came to the comments on learning English with teachers alone, it took more time for participants in 1M to adjust their emotions than for those in 1E.

Later on, the discussion further revealed a key contradiction between teaching beliefs—whether teaching should be teacher-centred or student-centred. One teacher (B1) remarked, "The reason I dislike teaching adults is that it causes much 'internal emotional friction.' Sometimes I am required to keep talking (about language knowledge) at certain stages, and then students feel unhappy about limited practice opportunities, which is not my fault. I do enjoy free practice, which is more student-centred, but it is only a part of the flow." Although many participants in 1M nodded in agreement about the importance of being student-centred, another participant supported being teacher-centred to some extent. This participant (B4) stated, "If we all care about students' feelings more than the content, it will end up with formalism... It is more important for them to learn something really useful than to be immersed in a fake illusion or just feeling happy."

Based on the researcher's observation, raising participants' awareness of the disagreement on teaching beliefs initiated a series of reflections on teaching practices in both participant groups. They noted that teachers often could not agree on solutions to conflicts or lacked ideas for resolving them. To deepen the understanding of the situation, the researcher examined all identified problems and conflicts, discovering two opposing pairs: concrete vs. abstract and teachers vs. students. Based on this, the researcher summarised and restructured the issues into four quadrants and mapped them on Miro for clearer categorization (shown in Figure 6 and 7).

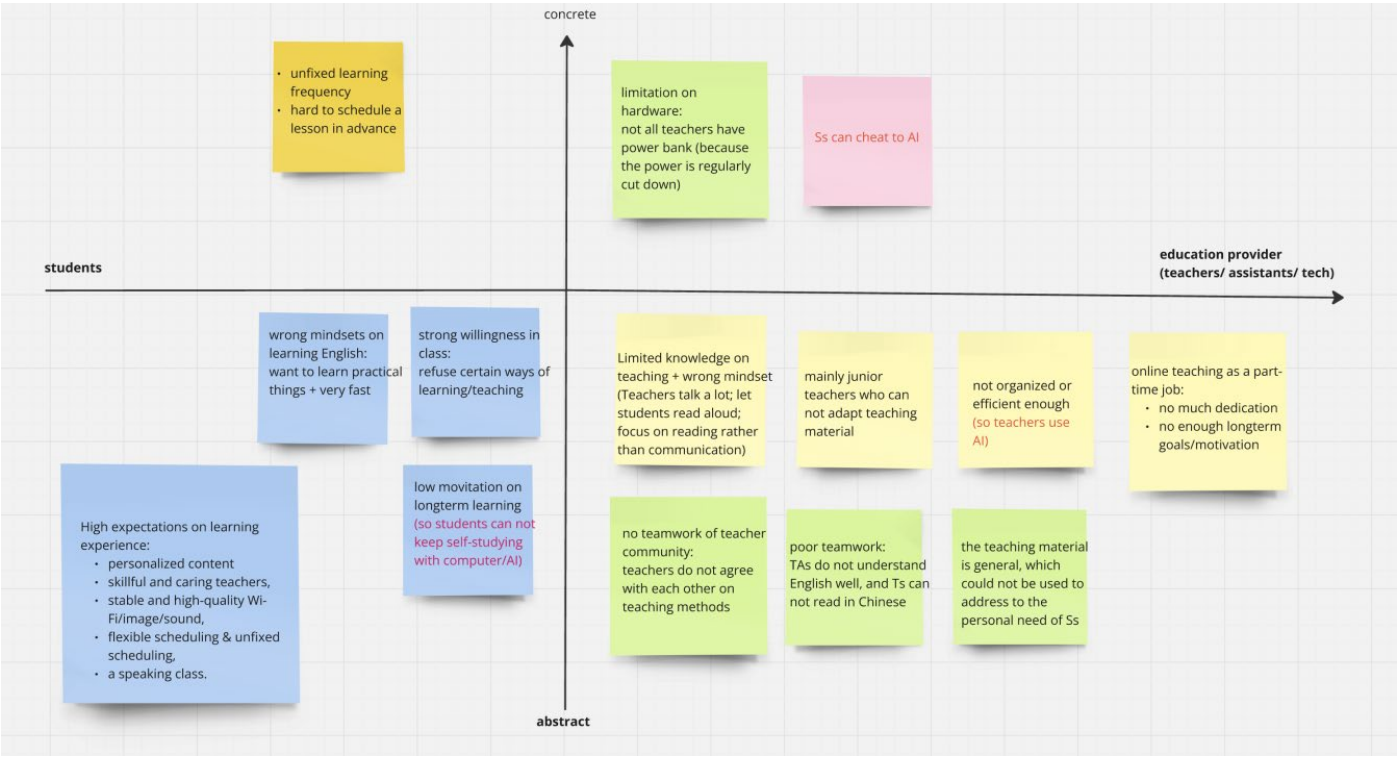


Figure 6. A summary of challenges by participants from South Africa (screenshot of Miro).

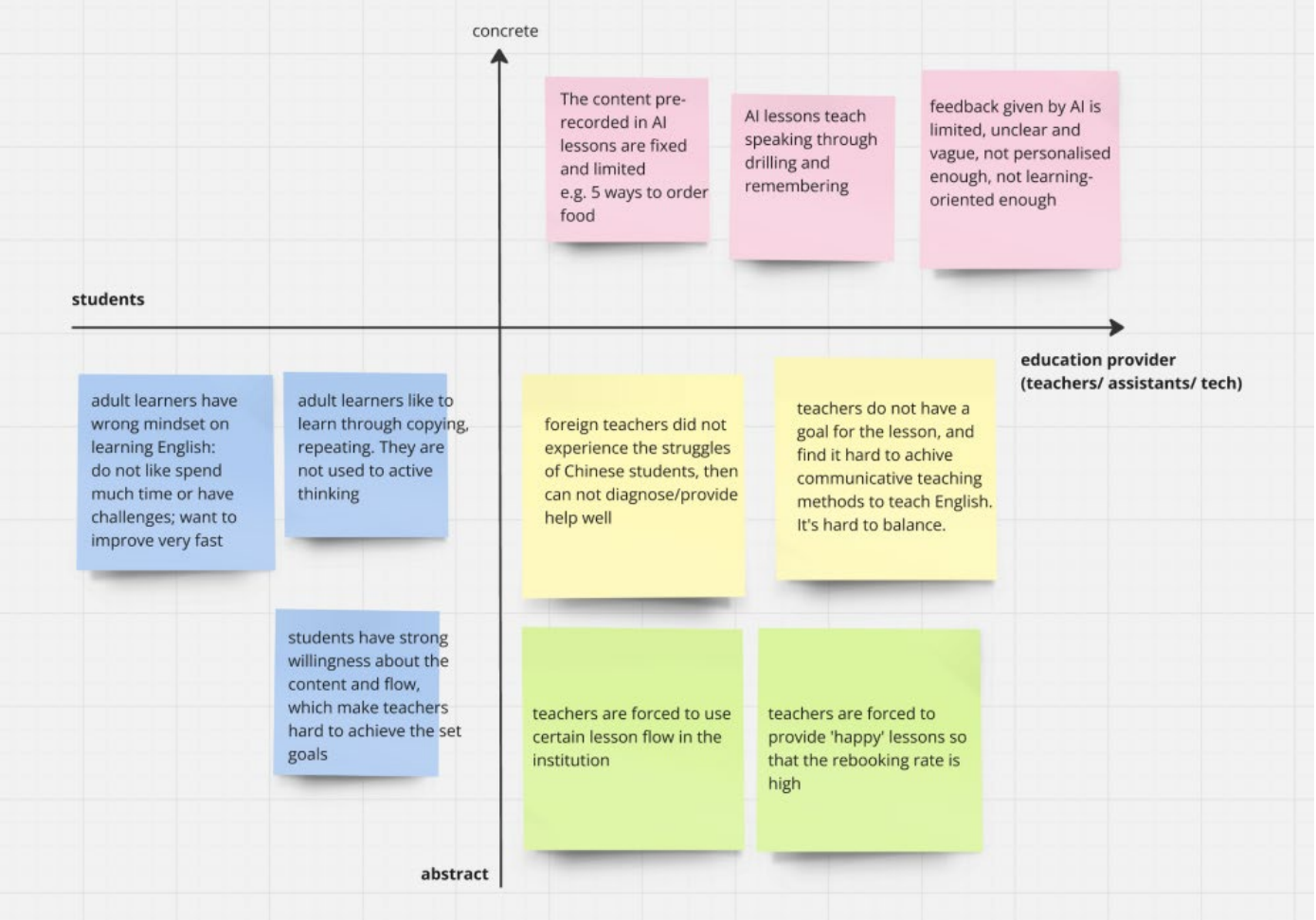


Figure 7. A summary of challenges by participants from China (screenshot of Miro).

The main conflicts were summarised as: (1) students wanting interesting and easy ways of learning, but teachers failing to achieve this due to the inherently dull and dry nature of language learning; (2) students desiring minimal time and effort, while language learning requires significant effort; (3) adult students demanding quick progress, which teachers struggled to deliver due to the nature of language learning, students' proficiency levels, and time investments; and (4) teachers having different goals in teaching adult learners, either to motivate them to keep learning or to impart knowledge, leading to divergent teaching methods and outcomes.

As participants delved into the root causes of ineffective teaching and learning, their critical questioning and discussions demonstrated a focus on underlying issues rather than just technology and its applications. This process not only identified initial contradictions but also set the stage for the historical and empirical analyses that followed.

3.2 Historical analysis

Historical analysis is central to expansive learning as it involves reviewing past practices, identifying contradictions, and learning from previous successes or failures. During the workshops, participants reflected on the history of using technology in teaching. However, the novelty of AI-based tools posed a challenge, as there was limited historical context or documentation available. Most participants in 2M began using blended English learning products in 2018

and were relatively junior teachers at the time. And participants in 2E started the journey around 2020. This background characterized them as a pioneering group of young teachers eager to experience educational reforms. To trigger the discussion, the author shared verbally her experience of working with educational technologies in online education industry, which was summarized in Figure 8 for this report. Then, the participants in both groups were motivated to share their own experience.

Year	Experience of Using Technology	My Role
2017-2018	Working with an ITS to create blended learning environment.	English Teacher
2019-2021	Designing content for online interactive learning applications which adopted NPL.	Content Developer
2022-now	Training teachers to collaborate with AI tutors who practice speaking English with students;	Training Manager
	Developing an intelligent student management system which can analyse learners' behavior and generate information for teachers/tutors to use	Product Manager

Figure 8. The author's experience of working with educational technologies.

The lack of extensive historical references made integrating new technology challenging. Chinese participants, shaped by traditional, exam-oriented methods, relied heavily on their personal experiences of learning English in offline classrooms. One participant (B2) stated, "I didn't have much to go on, but I know it is always right to focus on vocabulary and grammar. They are the foundation of English." Despite training in communicative methods, these traditional beliefs about language learning often prevailed. For example, one participant (B3) noted, "I have adult students who cannot pronounce most words correctly, and I spend a lot of time correcting each vocabulary. For these students, they should complete basic phonetic courses first." This contrasts with the communicative method's focus on fluency over accuracy, showing the tension between teachers' own learning history and new approaches.

In contrast, the two native English-speaking participants, relying on TESOL knowledge and they advocated for learning through context and communication. They emphasized fluency and real-world application, rather than focusing on vocabulary and grammar alone. While Chinese participants struggled to balance traditional methods with newer approaches, the native English-speaking teachers adopted communicative techniques more naturally. However, both groups agreed that teaching experience increased confidence, with each group refining their methods through practice.

Historical contradictions also arose between participants' prior knowledge and the new practices required by technology. B2 shared, "We've always done things a certain way, such as making notes for students in different ways on-screen. The virtual classroom forces us to change, and it's uncomfortable, but we know it's necessary." Other challenges included shrinking lesson preparation times, rigid camera settings, and standardized lesson formats, which were dictated by institutional policies.

Since both groups were working for similar companies in the same country, participants talked about the restrictions and pressure imposed by institutions, resulting in limited support or opportunities for involvement. One participant (C2) described a negative experience, stating,

"There was a time I was involved in the development of the teaching platform. An IT person observed me using it for an entire day, and I provided feedback. However, the new platform was even worse. I couldn't understand why I was involved but not heard." Such contradictions formed a critical tension point, driving empirical analysis and the development of new models.

3.3 Actual-empirical analysis

Empirical analysis in expansive learning involves observing how participants engage with tools and significant stakeholders in their current work context. This phase focuses on capturing the actual actions, behaviours, and interactions that occur as representing and explaining the structure of the activity.

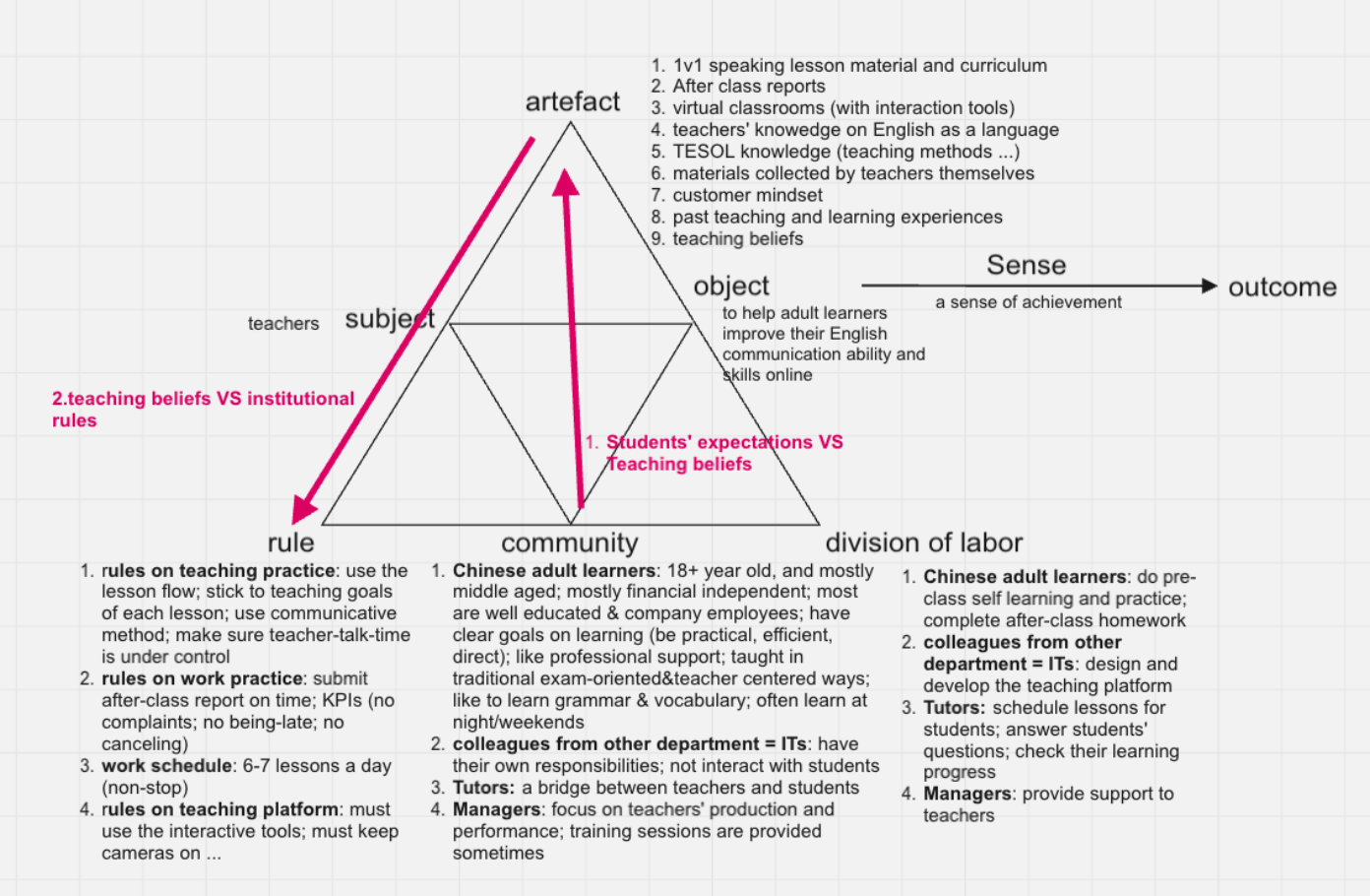


Figure 9. Teachers' activity system (summarised on Miro by the author).

The analysis of an activity system should always start with its object. It has been aligned among all participants that their key object was always helping students to learn English well, while a few teachers mentioned occasionally that they want to gain a sense of achievement in their work, which was interpreted by the researcher as the "sense" they got from working on the object (see in Figure 9). It has been shown in the above sections that in the first workshops on questioning, participants touched on how teachers were restricted by institutional rules on teaching practice and the limitations of virtual classrooms. In the second workshops, the clips of the interview with the tutor and her activity system were presented to inspire teachers to analyse their systems. And it is through this collaborative analysing activity (as depicted in Figure 9), participants found that the discrepancies between students' expectations and teachers'

objectives were evident, and conflicts primarily arise in the interactions between the abstract tools and other factors.

Both groups rationalized that adult students' (community) expectations on language learning, particularly regarding rapid progress, are often unrealistic. While teachers advocate for professional teaching plans and methods (tool) that seeks to bridge the gap, it often resulted in unsatisfaction of students and teacher burnout. One teacher (C1) remarked, "I tried to guide my students to set realistic expectations, but it was a struggle. I had to make long-term plans, yet they didn't return (back to book lessons with me)." Another (C2) added, "I've resorted to just following the standardized lesson flow because I feel it's the only way to ensure progress." This is related to another recurring theme, which is the inherent struggle to accommodate diverse student needs due to conflicts between their objectives and the rigid lesson flow and content dictated by institutional rules (rule). Similarly, one Chinese teacher (B2) noted, "I had a student preparing for a meeting with foreign clients who wanted personalized feedback, but I couldn't adjust the lesson flow." This illustrates the significant influence of institutional policies (rule) that limit teachers' opportunities to address students' unique requirements (community).

Moreover, a lack of motivation (tool) and insufficient professional training (tool) represented to be major obstacles for teachers be committed to their work, which is expected to influence their efforts. The issue of motivation was more serious in the English-speaking group. According to two participants (C1 & C2) who were teacher trainers as well, many young native English speakers enter online teaching with short-term goals and inadequate preparation both professionally and emotionally. This is particularly evident among those accustomed to exam-centric methods, and then struggle to transit to personalized, student-centred instructions. The tutor (A) articulated, "In the online classroom, students are customers seeking practical speaking skills, but some teachers still prioritize grammar over what students need." A similar case in 2M on how career motivation complicates instructional practice is that while some participants showed unwilling efforts and flexibility to adapt, some gave up making extra efforts. One teacher (B3) shared, "I am tired of creating personalized adjustments for each student because they are not serious learners, and I'm just fatigued. I think it is my duty to follow the standard flow and focus on the students who really want to improve."

However, the effective adoption of these innovative technologies is hampered by various technical challenges. Participants working from Johannesburg reported issues such as unstable Wi-Fi connections and outdated hardware, which severely limited the practical integration of AI tools in classrooms. Such barriers could dissuade teachers from embracing new technologies, ultimately resulting in a diminished learning experience for students and growing dissatisfaction. While participants in 2E emphasized the urgent need for reliable power sources and comprehensive training on how to navigate these platforms, Chinese participants reported frustrations with overloaded platforms and rigid teaching equipment. The situation was dire for Chinese teachers, who frequently encountered sudden classroom breakdowns and the logistical nightmare of transporting advanced technology—including high-capacity computers and specialized equipment—between locations. Conversely, South African participants were often compelled to invest in large storage batteries to sustain essential services like Wi-Fi, which only exacerbates existing inequalities, particularly for prospective teachers lacking the financial means to procure necessary equipment for online instruction.

Furthermore, it is concerning that many teachers in both groups had been blissfully unaware of students' engagement with intelligent 'AI teachers' on their phones, which is also a part of the service package that sold by the companies, like NPL-based applications supporting pronunciation correction and semi-structured conversations. There is one example where the

participant B2 requested to view the learning content of students but was refused by the manager who believed that it was irrelevant to teachers' work. To compare the 'artefact' part of the tutor's and teachers' activity system (Figure 10), it is noticeable that teachers generally had no idea about the intelligent learning tools. This disconnect resulted in inconsistencies between in-class instruction and the feedback provided by these platforms, leaving students and teachers in a state of confusion and feeling unsupported. It also shows that upper echelons of educational management fail to underscore the importance of integrating modern technologies into pedagogical practices.

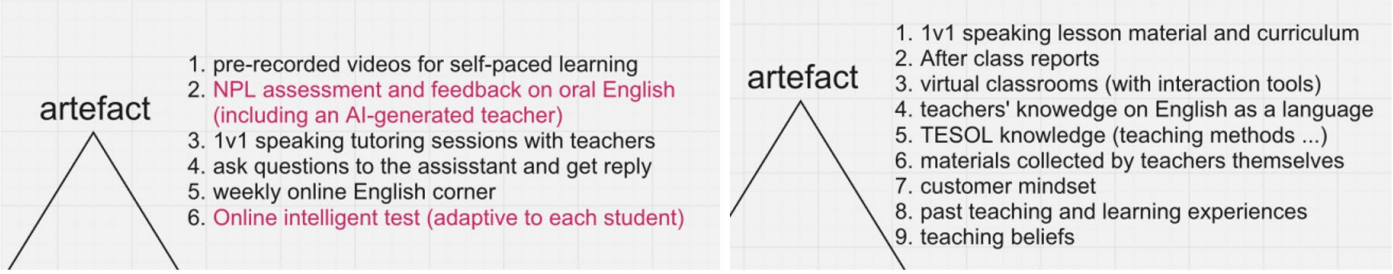


Figure 10. The 'artefact' part of the tutor's and teachers' activity system.

The role of tutors also emerged as a critical factor. In many TESOL settings, tutors work closely with students and have access to more detailed data from AI tools, while teachers often lack this visibility. This creates a division of labour that prevents teachers from fully utilizing the information generated by AI systems. The tutor (A) observed, "I have access to all the data on how students are doing, but I don't think the teachers know how much their students are engaging with the tools." This disconnect undermines the potential for AI to support a holistic learning experience.

Despite a general recognition among teachers on the potential benefits of AI-based tools, such as ChatGPT, their motivation to utilize such technologies diverges markedly across different regions. The researcher argues that the teachers who want to teach more for higher salary would be more likely to use AI-based tools for its efficiency. For instance, South African participants exhibited a robust enthusiasm for leveraging AI in lesson planning—engaging in task design, resource discovery, and homework creation, so that their workload could be reduced, and they could teach more. In stark contrast, only a few of part-time teachers from China intermittently employed AI to seek teaching resources, indicating a significant gap in both utilization and enthusiasm.

In conclusion, these findings illuminate a troubling reality: teachers continue to be largely oblivious to internal intelligent tools students use for practice, which leads to significant discrepancies in the overall educational experience, and they have limited motivation to use external AI-based tools for work. The lack of proactive engagement from higher-level administrators regarding the integration of modern technologies exacerbates this issue, potentially leaving students to navigate their learning journeys feeling unsupported and bewildered.

3.4 Modelling

Modelling is the final phase of expansive learning, where participants begin to construct new models or frameworks that synthesize the inspirations gained through previous actions. In the workshops, the modelling phase was not initially planned by the researcher, but it emerged organically as participants began to develop their own models based on their experiences of

questioning and analysis. The author summarised the content in 1M and presented the activity system on Miro as Figure 11. It became a meaningful aspect of the workshops as the model that they created served as a tool for further collaboration, allowing participants to clarify their thinking, identify areas for improvement, and refine their approaches.

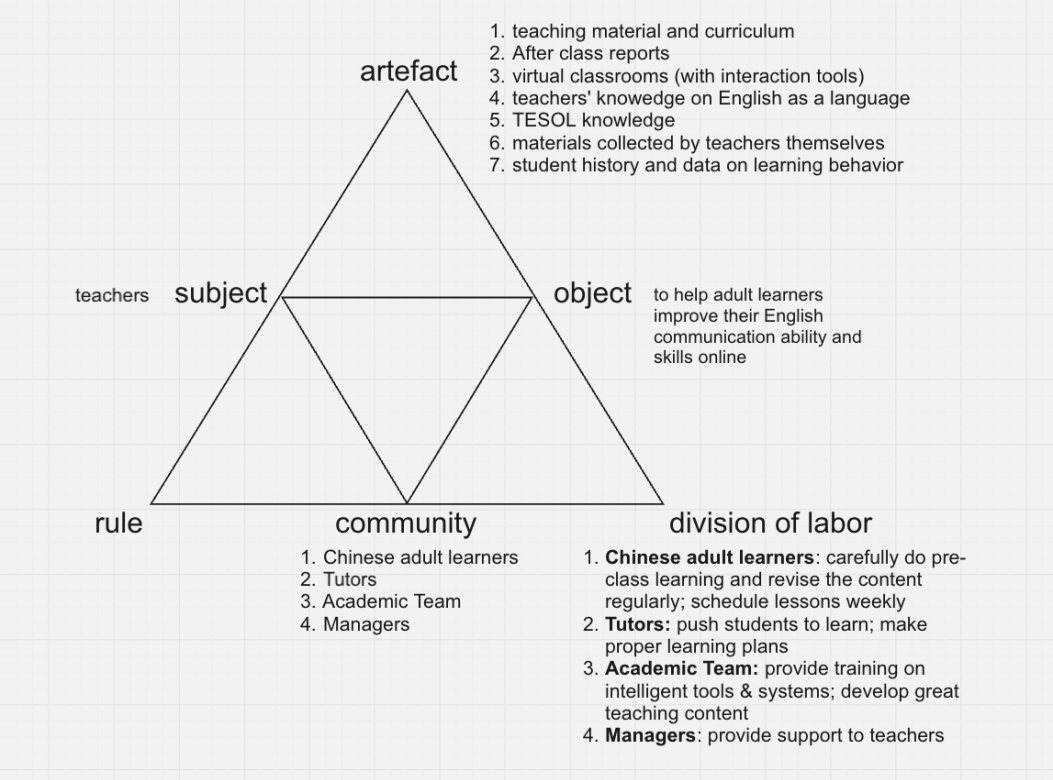


Figure 11. Activity System on modelling (summarised by the author on Miro).

However, the model created was still in its early stages, reflecting both the nascent nature of collaborative teaching with technology and the limited experience participants had with it. For example, participants expected their students to meticulously engage with pre-lesson content and schedule one-on-one speaking lessons regularly, which did not align with the learning preferences of adult learners. This highlights a gap between the teachers' understanding on learners and the needs of their learners. A notable improvement, however, was that teachers began to recognize the importance of professional training in using AI-based tools effectively. While many participants saw the potential of AI to enhance their teaching, they also felt unprepared to leverage these tools fully. One teacher (B1) explained, "I know AI could help me be more efficient, but I don't feel confident using it because I haven't been trained properly." This gap in confidence underscores the need for professional development to bridge the divide between AI-based tools and teachers' competencies, empowering them to take more agency in how they incorporate AI into their teaching practices.

This initial modelling process provided a foundation for further development, highlighting the iterative nature of expansive learning, where knowledge is continually refined through practice and reflection.

4. Experiences

In this section, the researcher reflects on her experiences as a first-time designer and facilitator of Change Laboratory workshops. The researcher will discuss the challenges that she faced in designing and conducting the workshops, particularly in balancing structure with flexibility, managing time effectively, and addressing the limited scope. These reflections will inform approach to future workshops in her formal PhD project.

As a novice Change Laboratory (CL) designer and implementer, the researcher encountered several challenges that shaped her understanding of the process. Due to the logistical constraints of working with online educators who had demanding schedules, the workshops were intentionally shortened to one hour each, limiting the depth of engagement in expansive learning actions. For example, in one session (1M), participants struggled with the questioning action and required more time to delve into their reflections, but the researcher had to accelerate the process, which potentially sacrificed meaningful deep discussion. Another challenge was managing discussions that occasionally drifted away from the intended focus. For instance, during a modelling action, participants in both 1M and 2M began discussing frustrations with their students' resistance to change rather than focusing on systemic contradictions. While such moments revealed participants' true feelings and important insights, the researcher felt uneasy redirecting the discussion. Additionally, balancing cultural sensitivities while encouraging deeper analysis proved complex. For example, Chinese participants often hesitated to critique institutional policies openly, requiring the researcher to create a supportive atmosphere to foster more critical reflections. These experiences highlighted the need for stronger facilitation skills, particularly in navigating diverse group dynamics, ensuring sustained engagement, and striking a balance between structure and flexibility.

One of the most significant challenges was finding the right balance between structure and flexibility. Initially, the researcher tried to provide clear guidelines and instructions, assuming that participants would benefit from having a well-defined roadmap. However, the researcher soon realized that the expansive learning process requires a greater degree of openness and flexibility. For example, the questioning workshop with Chinese participants was completed in a hurry after participants having a hot discussion on certain topics, and it would be better if another workshop could be scheduled to further the discussions. Within the workshops, participants needed the freedom to explore, experiment, and make mistakes without the pressure of adhering to a rigid structure. In future workshops, the researcher plans to prepare more alternatives on both tasks and mirror data so that the workshops could be more adaptive and flexible, and to encourage participants to take more ownership of the learning process.

Another critical issue was the lack of engagement from management in the workshops. The absence of institutional leaders or decision-makers limited the scope of the discussions, which has been discussed in the findings of modelling, and the participants might feel less motivated that their suggestions would not be heard and taken at higher levels. Future interventions should prioritize the inclusion of institutional stakeholders, ensuring the diversity of conversations.

Reflecting on the whole process, the researcher highly appreciates having a pre-designed workshop outline which played a key role keeping both the novice host and participants on track and ensuring productivity. In future workshops, the researcher will combine the lessons learned in this pilot study and ensure that the outline is structured with reasonable tasks and engaging tasks for participants to lead the conversations.

5. Discussion

In this section, the researcher will discuss the influence of cultural agency, which is an influential factor for cross-cultural workshops, and focus on how the Activity System is potential to bridge the gap and foster collective learning among participants from different cultural background.

A key highlight of the study is the cultural context in which these AI tools are deployed, particularly the differences between Chinese participants and their counterparts who speak English as their first language in how they navigate the expansive learning actions in the workshops. The contrasting cultural approaches to authority, hierarchy, and innovation emerged as central themes influencing participants experiences and behaviour. This aspect of the study is critical in understanding how different socio-cultural environments can shape collective learning activities , including the Change Laboratory itself.

In workshops 1M and 2M, there was a notable deference to institutional authority and a strong adherence to hierarchical structures, which significantly influences how teachers react in the questioning and analysing action. This cultural dynamic, rooted in broader societal values that prioritize order and compliance, created a scenario where participants were less likely to criticise or challenge the top-down directives imposed by institutional leaders. As a result, Chinese participants in this study demonstrated passive and hesitating replies, even when they felt that these tools were misaligned with the specific needs of their students. By contrast, participants who speak English as their first language were more vocal in advocating for changes to the system. Their approach reflects a more individualistic and flexible cultural mindset, where innovation and professional autonomy are valued. These dynamics highlighted how community expectations and cultural norms intersect with people's ability to reflect and analyse. On the other hand, people reluctant to be critical were sensitive to negative feedback as well. Participants who speak Chinese seemed to be overwhelmed by the mirror data, negative feedback from students on social media, even when it was not on the participants as individuals.

This reflection on cultural variation highlights the importance of considering cultural differences when designing CL workshops and adapting facilitation style accordingly. Researchers must recognize that a one-size-fits-all approach is not effective, particularly when participants come from vastly different cultural backgrounds. Instead, there is a need for localized approaches on collecting mirror data, designing tasks and their sequencing, and time for each task, where the specific socio-cultural norms and values are considered. This is particularly important in contexts like China, where hierarchical institutional structures can inhibit the full realization of agency, and in contrast, participants who speak English as their first language feel less constrained by their instructional tools. In future workshops, the researcher will be more mindful of these. This may involve offering additional scaffolding or guidance for participants from hierarchical backgrounds, helping them navigate the shift to a more participatory learning environment.

The Activity System Model was instrumental for both groups in identifying the systemic contradictions that hindered the effective integration of AI tools in TESOL contexts. It demonstrated that participants from different cultural backgrounds shared similar challenges and insights. While the language and communication styles varied between the two groups, the use of the Activity System as a second stimulus proved effective across both sets of workshops. This consistency underscores the importance of well-designed second stimuli in guiding participants to reflect on contradictions. One shared contradiction was the discrepancy between the object of the activity (helping students improve English) and the mediating tools (fixed teaching

content and flow). Most participants expressed frustration over the limitations of these tools, which often failed to accommodate the individual learning needs of their students. This misalignment was particularly pronounced in contexts where student expectations were high, such as with Chinese adult learners demanding rapid progress in their English-speaking abilities. The rigid assigned content and regulated lesson flows left teachers struggling to meet these expectations, resulting in burnout and student dissatisfaction. This highlights the potential of the Activity System to bridge cultural and professional differences, providing a robust framework for future CL workshop designs.

The Activity System will be essential in helping participants connect their individual actions to the larger goals of the CL workshops. It creates a shared understanding of the role of teacher practice in collaborative teaching with technologies, allowing participants to see how their contributions fit into the broader system. Reflecting on the contradictions identified during the previous analysis phases was crucial in moving participants toward the modelling phase. These earlier discussions, particularly around systemic contradictions, provided the foundation for participants to propose solutions such as inter-professional training and collaborative AI tool development. These solutions reflect their shared understanding that AI tools should not be static but dynamic and adaptable, capable of addressing the diverse challenges posed by students' expectations and teachers' needs. As a conclusion, the process of participating in CL workshops is not only about improving teachers' competencies with AI-based tools but also about ensuring their professional identities are respected and supported.

By linking individual actions to the collective process, the Activity System helped participants in the same workshop develop a sense of shared responsibility and mutual support. Observations during the workshops indicated that participants in M1 and M2 collaborated extensively, generating ideas as a unified group and expressing mutual appreciation. Following the workshops, most participants expressed interest in participating in similar CL projects in the future and in continuing to engage with the community. This suggests that the collaborative process was central to the expansive learning model, as it enabled participants to move beyond traditional methods and engage in more dynamic, participatory learning experiences. Additionally, it appears that bringing together participants from diverse cultural backgrounds in the same CL workshop could foster greater interaction and stimulate innovative ideas.

6. Conclusion

The findings from this study illustrate the challenges and opportunities associated with using the Change Laboratory model in the context of online TESOL with AI-based tools. Participants navigated significant hurdles, including the novelty of the workshops and cultural differences, yet engaged in meaningful, transformative learning processes.

Lessons from this study will inform future workshops, enabling the researcher to refine facilitation approaches, accommodate cultural variations, and better structure learning environments. By leveraging the Activity System as a second stimulus and encouraging collaborative engagement, these workshops can foster more effective and inclusive learning experiences.

Reflecting on the broader implications, the integration of AI in TESOL is not merely a technological challenge but a complex social and cultural issue. The findings emphasize the importance of teacher agency, cross-cultural understanding, and systemic support in designing AI tools. If developed with these principles, AI technologies have the potential to transform TESOL by providing personalized, efficient, and culturally responsive instruction.

In conclusion, this study contributes to the development of Change Laboratory methodology, offering insights for similar contexts and advancing understanding of expansive learning in practice.

About the author

Yurou Song is an Academic Manager specializing in teacher training for online English courses for adults in China. Her current work focuses on natural language processing technologies, intelligent tutoring systems, and integrating diverse sources of human expertise. Yurou is passionate about inter-professional teaching collaborations, combining expert elicitation with artificial intelligence-based technologies. She is particularly interested in Activity Theory and the potential of the Change Laboratory methodology in research projects, aiming to empower participants to envision and enact systemic reforms.

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