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Language teachers' professional identities and classroom technology integration

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Abstract

Teachers' role identities shape their teaching practices. However, research on the interplay between language teachers' role identities and classroom technology integration is rather limited. Based on interview responses and classroom observations of eight K-12 language teachers, this study revealed two contrastive forms of role identities that were influential in technology use, namely the broader educator roles and the narrow subject teacher roles. Teachers with the two forms of role identities diverged in their technology use approaches, purposes, and resilience. The findings further revealed that teacher role identities interplayed with technology use in a mutually shaping and constantly evolving manner. The findings advocate greater attention to teacher role identities when examining and supporting classroom technology integration.

Keywords: *Teacher Professional Identity, Role Identity, Teacher Technology Integration, Nature of Technology Use*

Language(s) Learned in This Study: *Mandarin Chinese*

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Introduction

Technology plays an essential role in classroom language learning, not only boosting engagement and effectiveness, but also breaking the temporospatial boundaries and providing authentic and personalized learning experiences (Blake, 2013; Chun et al., 2016). The positive effects of technology on language development have been substantiated in various meta-analysis studies (for example, Plonsky & Ziegler, 2016). Enhancing teachers' classroom technology integration hence has drawn much research attention. Existing studies have featured a wide array of external factors (for example, resources, instructional time, professional training and support, facilitating conditions, and social norms) and internal factors (for example, teachers' knowledge and skills, attitudes and beliefs) that shape *whether* and *how often* teachers adopt technology (Author et al., 2023a; Huang et al., 2023; Sun & Mei, 2022). However, as the intense technological experience of emergency remote teaching during the Covid-19 pandemic has reinforced the normalization of technology for language teaching in many contexts (for example, Author et al., 2023b, Moorhouse et al., 2023), understanding the *how* of technology use is becoming increasingly pertinent and critical. For the *how* of technology use, factors related to identities, such as teaching role identity, play a more prominent role and merits research attention (Nach, 2015). Identity, a set of self-meanings that define who one is in relation to some social categories or material objects, is a shaping force of how individuals perceive and use technology (Carter & Grover, 2015; Nach, 2015). Nonetheless, existing technology adoption models overemphasize teachers' perceptions of technological characteristics and relevant skills

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and attitudes, overlooking the role of identities in the process (Liu & Geertshuis, 2021). Attention to identity is particularly important in the K-12 teaching context, where teachers are subject to strong structural influence and curriculum constraints in technology integration. As teaching role identities are found to help teachers overcome challenging situations and counter psychological distress (Kim & Asbury, 2020; Pretorius & Padmanabhanunni, 2022), it is imperative and important to understand the relationship of role identity and technology integration in the K-12 context.

Previous studies have substantiated the influence of teachers' professional role identity on technology integration (for example, Gong & Lai, 2018; Liu & Geertshuis, 2021). However, these studies fail to shed light on how facets of professional role identity co-existing with an individual teacher, such as classroom role identities versus school community role identities, interplay to influence technology integration. Moreover, current studies have predominantly examined the one-way influence of teacher identity on technology adoption. Given that identity and behavior have a two-way relationship over time (Barkhuizen, 2016; Pennington & Richards, 2016), studies are needed to unravel the reciprocal influences of teacher role identities and technology use on each other over time. This study aimed to fill the gap by examining the interplay of a group of K-12 language teachers' professional role identities and classroom technology integration.

Teacher Role Identity

Various facets of teacher identity have been discussed in existing literature, such as task perception, commitment, emotional aspect of identity, sociocultural identities (for example, ethnic, racial, cultural, class and transnational identities), gendered identities, and linguistic identities (Hanna et al., 2019; Kayi-Aydar, 2019; Varghese & Snyder, 2018; Wolff & De Costa, 2017; Yazan, 2018). Professional identity, the self-imposed or other-attributed meanings of one's roles as a teacher, is an important aspect of teacher identity as it entails how teachers define the purposes of their work and appraise job success (Beijaard et al., 2004; Pennington & Richards, 2016; Popper-Giveon & Shayshon, 2017). Role identities are at the core of professional identity (Barkhuizen & Mendieta, 2020; Popper-Giveon & Shayshon, 2017). Role identities refer to the perceptions, beliefs and attitudes that teachers hold about their professional roles, as well as associated functions and concomitant behaviors they perform that constitute an image of who they are or wish to project (Barkhuizen & Mendieta, 2020; Shafiee et al., 2022). Role identities consist of a combination of interconnected roles in relation to the disciplinary content, instructional methods, students, teaching contexts, the profession, and one's future goals and aspirations (Barkhuizen & Mendieta, 2020; Pennington & Richards, 2016). Pennington (2015) classified the myriad roles into two frames: the *practice-centered frames* that connect directly to one's teaching (that is, facets of language teaching in relation to the disciplinary fields, instruction, student service, and so forth) and the *contextual frames* (that is, aspects of the context, the school community and beyond, where language teaching is situated). Layers of role identities from these two frames interplay to shape a teacher's behavior.

Different role identities have their own voices and aims, and hence may cause tensions (Popper-Giveon & Shayshon, 2017; Varghese et al., 2005). These role identities co-exist in a hierarchy order, with some being more prominent and exerting a greater influence on individuals' behaviors in a certain situation and at a certain time (Barkhuizen & Mendieta, 2020; Wang et al., 2023). Moreover, role identity is constantly constructed and reconstructed socially and discursively in individuals' interaction with environments (Barkhuizen, 2016; Beijaard et al., 2004; Yazan, 2018). Individuals construct role identities based on their (re)interpretation of relevant past, present, and future experiences either reflexively or interactively in the social contexts (Barkhuizen & Mendieta, 2020). Schultz and Ravitch (2013) thus highlighted a two-way cyclical interaction between role identity and experience: teacher role identity emerges from teachers' experience, and in turn shapes their construction of new experience.

Teacher Role Identity and Technology Use

Teachers' professional role identity shapes their ability and willingness to implement pedagogical innovations, and hence may influence classroom technology integration (Beijaard et al., 2004). Technology

also serves as a resource and medium for identity validation and performance, being part and parcel of the teaching self (Bourdreau et al., 2014; Carter & Grover, 2015). Thus, teacher role identity and technology use are closely intertwined.

Role identities have been found to shape language teachers' classroom technology integration. Embracing the self-image as an open-minded innovator helps overcome technology integration challenges (Chu & Chen, 2016; Gong & Lai, 2018). Self- or socially-imposed identity concerning teaching experience (that is, a novice or an experienced teacher) and digital experience (that is, a digital immigrant or a digital native) are found to not only shape technology integration intentions but also mediate the transition from professional development to classroom teaching (Gong & Lai, 2018; James & Lee, 2021). Moreover, teaching task perceptions (such as instructional approach orientations and perceived expertise in teaching) frame the nature of technology use. For instance, learner-centered instructional orientation is associated with innovative and diversified technology use (Liu & Geershtuis, 2021; Tondeur et al., 2017), whereas teaching-centered instructional orientation is associated with either transmissive approach to technology adoption or none at all (Author & Colleague, 2021; Liu et al., 2017).

However, this growing body of literature has predominantly focused on the one-way influence of a particular facet of teacher role identity on classroom technology integration. Ignoring the multifaceted, interconnected, and fluid nature of teacher role identity may produce limiting and even biased insights. For instance, examining teachers' conceptions of teaching tasks in relation to instructional goals, instructional approaches, and professional expertise in concert, Author & Colleague (2021) revealed that it was teachers' emphasis on subject matter knowledge as the instructional goals and their fixation with subject matter expert role identity that drove teacher-centered, delivery-focused technology use, instead of the instructional approach orientations often reported in existing literature. Thus, examining multiple facets of teacher role identity simultaneously may generate more meaningful insights.

This study thereby examined the interplay of various teacher role identities at the practice-centered and contextual frames (Pennington, 2015) with teachers' classroom technology integration, addressing two research questions:

RQ1: How do various role identities shape teachers' classroom technology integration?

RQ2: How do teacher role identities and technology use interact with each other?

Material and Methods

Since teacher role identity is of a multifaceted nature, involves sense-making of one's professional experience, and is (re)constructed in interaction with social contexts, qualitative methods are suitable to gain insights into this complex research issue (Hong & Cross Francis, 2020). We adopted a multi-case research design to garner comparative insights into the interplay of facets of role identities in relation to classroom technology integration (Gustafsson, 2017).

Research Context and Participants

Participants were eight full-time Chinese language teachers from international schools in Hong Kong. The sampling rationales were: 1) International schools have good technological infrastructure and positive school culture in support of technology integration. Teachers at these schools more or less adopt technology in teaching. The teaching context made it possible to examine our research question on how the nature of teachers' technology integration intertwines with identity. 2) Chinese language teachers grew up with Confucian culture-shaped ways of thinking about teaching and learning. Working at international schools immersed them in western culture-dominated working environments. This may cause ideological clashes, increasing the likelihood of observing greater variation and complexity in conceptions about teacher roles among the participants. Thus, targeting this group of participants allowed us to explore the research issue in depth. Email invitations were sent out to Chinese language teachers from different schools to elicit voluntary participation, whom the researchers had contact with from different professional development events. Consent was obtained prior to data collection and pseudonyms are used in this paper.

The eight teachers had a wide range of backgrounds (Table 1). They came from three international secondary schools with different student populations: School A had primarily expatriate students; School B had roughly equal local and expatriate students; and School C had primarily local students. They were experienced teachers, most having more than five years of teaching experience. They were highly educated with master's degrees. The majority of them taught Chinese as a first language (L1) classes, and half of them also taught Chinese as a second language (L2) classes. The L1 classes focus on Chinese literacy and literature, while the L2 classes emphasize communicative Chinese.

Table 1

The Participants' Profile

	Gender	Teaching Experience	Grade Level	Language Level Taught	Educational Background	School
Lee	F	>10 years	1, 3, 5	L1 and L2	BA + postgraduate certificate in teaching	A
Huang	F	24 years	7, 8, 10, 11, 12	L1 and L2	Master of Education	B
Wen	M	7 years	7, 9, 10, 11	L1	Master of Education	C
Xu	F	7 years	6, 7, 8, 9, 11	L1	Master of Education	C
Zhang	F	>10 years	7, 8, 9, 10	L1 and L2	Master of Art	B
Li	F	5 years	6, 8, 12	L1	Master of Education	C
Jia	F	8 years	7, 8, 11, 12	L2	Master of Art	A
Wang	F	4 years	1, 3, 4, 5	L1 and L2	Master of Art	A

Data Sources and Collection

The data source in this study included semi-structured individual interviews, and classroom observations with post-lesson follow-up interviews. The theoretical lens of teacher identity being multifaceted, interrelated, situated, and fluid guided the interview questions and data analysis.

Individual interviews were conducted to register the participants' subjective perceptions and accounts. The interviews were framed around a few general topics that enabled interviewees to freely share their conceptions, feelings, and practices. We invited the participants to share educational and teaching backgrounds, and their use of technology in teaching and related decision-making. We also elicited the participants' perceptions of their role(s) as a teacher at both practice-centered and contextual frames, following Pennington's (2015) framework. Guided by the theoretical lens that identity dimensions are interrelated, situated, and fluid, we further invited the participants to share whether and how their role identities were connected with technology use, and reflect on changes in technology use and role identification, if any, over the years. Follow-up elaboration and clarification questions were asked to delve deeper into each interviewee's accounts (See supplementary file [Appendix A](#)).

The interview questions were pilot tested with one Chinese language teacher who was not included in the study and the questions were modified to enhance clarity. Each interview lasted around 45 minutes, with a total of 6.2 hours of interview responses collected. The interview was conducted in the participants' native

language. The researchers discussed interesting points that emerged from each interview and took field notes to record their observations.

To examine identity in action and observe technological behaviors in class, class observations were conducted, upon school consent, in the ensuing months. Each participant teacher was first shadowed on one randomly selected day to observe the lessons they taught at different grade levels to obtain a general sense of their teaching style and identity in action. Afterwards, one class was randomly selected for subsequent class observations. Class observations lasted approximately two months, focusing on a complete unit's worth of lessons for that class. Two research assistants conducted the class observations to minimize the possibility that participants might feel pressured when observed by university researchers and hence change normal teaching behaviors. An observation note was used to record information about each lesson: background information, the teaching goals, the flow of activities, teachers' actions and interaction with students during each activity, and technologies and materials used during each activity. Around 58 hours of class observation data were collected. Immediately after the lessons with technology-mediated activities, the research assistants chatted briefly with the participants about intended outcomes and rationales of the technological activities and took notes to record the conversations.

Data Analysis

The interview data were transcribed word-for-word in Chinese by research assistants and double-checked for accuracy by one researcher. The transcribed interview responses were manually coded, and thematic analysis was conducted. The data were analyzed inductively through a cyclical and evolving process of coding and recoding (Saldaña, 2015). For each interview transcript, in vivo coding was first conducted to code the data using the participants' own words. The utility of the codes was assessed, and codes were recoded, categorized or discarded accordingly. Pattern coding was then used to categorize similarly coded excerpts under overarching codes. For instance, "stimulate their thinking", "guide them to inquire", "help them learn", and "summarize and extend their ideas" were grouped into a concrete category "facilitator role". Categories that pointed to the same underlying idea or meaning were aggregated into more unifying codes. For instance, the co-presence of "facilitator role", "learning skill coach role", and "subject teacher role" were coded into a provisional analytical category, "broad educator role". See [Table 2](#) for the coding scheme on teacher role identity. After categorizing teacher role identities into themes, we proceeded to categorize the nature of technology use (for example, codes like "technology for material presentation" and "technology for learning material management" were coded into a provisional analytical category "technology use for content delivery"). We then analyzed technology use in relation to each role identity with a purpose to reveal the interplays between role identities and technology use (for example, "broad educator role associated with technology use for life and learning skills").

Afterwards, we contextualized the analytic results into classroom observation data for triangulation. The class observation episodes of each participant that involved technology use were coded using the analytical categories on the nature of technology use, such as "technology use for content delivery", "technology use for student voice", and "technology use for life and learning skills", and added to the corresponding interview excerpts. Notes on the post-lesson conversations were coded with the analytical categories on the relationship of identity and technology use (See supplementary file [Appendix B](#) for the coding workflow). Two participants' data (25% of the data) were randomly selected from the full dataset and were re-coded independently by another researcher. The intercoder reliability was 84%.

The initial coding of analytical categories was then compared across interviewees to find repeating ideas to cross-validate the categories that emerged, and saturate categories with supporting evidence. Moreover, varied aspects of technology use among interviewees with similar and different identity profiles were compared to further reveal the relationships of role identity with technology use. Interview field notes and reflexive coding memos were referred to when generating the analytical categories. The categories were then examined in reference to the theoretical lens to generate the overarching themes that synthesize the relationships between the analytical categories, which are reported in the results section.

Table 2*The Coding Scheme of Different Facets of Teacher Role Identity*

	Definitions	Categories & Subcategories	Example Codes
Practice-Centered Frames	“different orientations to the practices involved in TESOL work” (Pennington, 2015; p. 19)	Broad educator role	“learning skill coach” “semi-actor” “co-participant” “instructional designer” “facilitator”
		Subject teacher role	“lecturer” “director” “Chinese learning motivator” “exam preparer”
Contextual Frames	“different aspects of the context of TESOL work” (Pennington, 2015; p. 25)	School member role	“school policy implementer” “team player”
		Professional and wider community role	“technology pioneer” “tech leader” “tech savvy”

Results

Teacher Role Identities Shape the Nature of Technology Integration

The participants' discussion of role identities relevant to technology adoption manifested two major contrasting forms: broader educator roles and narrow subject teacher roles. Broader educator roles were characterized by broad self-positioning in job responsibilities and a flexible and adaptive mindset in performing job functions. Four teachers manifested broader educator roles in their professional identities. To Wang, facilitating knowledge construction in Chinese language and supporting the development of generic learning skills and “long-term confidence in and interest in learning” were two major aspects of her teaching role. She regarded helping students become “happy lifelong learners” as her ultimate responsibility. Her view of valuing knowledge and skills beyond the subject matter was shared among some participants. This group of participants positioned themselves as an educator who was responsible for both developing students' disciplinary knowledge and their lifelong skills and attitudes, such as “thinking skills” (Li), “learning strategies” (Jia), “cross-disciplinary skills”, and “learning how to learn” (Zhang). Correspondingly, they assumed a flexible stance towards daily teaching responsibilities. Li shared that she was open to diversions from preset teaching objectives during a lesson, as long as the deviation benefited students' inquiry and knowledge construction. Jia highlighted her “semi-actor” role, in contrast to the conventional “teacher-as-director and student-as-actor” role allocation, where teaching plans were changed on the go in response to student feedback. These participants also took a relative and adaptive view towards teaching approaches, disagreeing with a fixed way of teaching. To them, “constant trial and error” and “diversity in teaching” were the norm.

In contrast, the other four participants manifested a narrow subject teacher role, focusing solely on them being a Chinese language teacher whose main responsibility was to impart language skills and cultural knowledge. For instance, Lee mentioned that she was not a classroom teacher, and thus students' social skill development was not her responsibility. Moreover, they defined their subject matter teacher role in a controlling manner, such as "a person who locates and collects appropriate resources for students" (Lee), or "a leader in the classroom who leads them to study" (Xu). In Wen's words, "inside the classroom, they are learning under my guidance. I always try to get things under control". They regarded that their responsibility lay more in guiding students to sail through examinations or grasp the knowledge system, attending less to the learning process. Thus, their teaching role identity was characterized by a narrow and rigid subject teacher identity that was subject-matter centric and teacher-control dominated.

Teacher Role Identities Shaped Pedagogical Approaches to Technology Integration

The participants who held the subject teacher role identity frequently mentioned using technological tools like Keynote and PPT to enhance the visual presentation of instructional contents, tools like YouTube and audio recorders to create and display "authentic" materials that connected closely with the textbook topics, and tools like Seesaw and Google Classroom to upload materials and collect assignments. Although they did use technological tools (for example, Google Classroom and Padlet) that could support student agency, collaboration and creative production, they used these tools in a teacher-centered manner (for example, providing reading comprehension question and vocabulary lists, dividing up the vocabulary list for students to work on individual portions, and then pooling answers as a class glossary or note). When asked to elaborate on the rationale behind a collaborative vocabulary learning activity on Google Doc during a lesson observed, instead of using the activity to support students' knowledge co-construction, Xu recounted designing the activity to merely free herself to teach individual students one-on-one (*Class Observation and Follow-up Interview*). This teacher-dominated way of technology use was also observed in a vocabulary review activity prior to dictation, where instead of letting students use Quizlet on their own for personalized study, Huang displayed Quizlet from the teacher workstation as a whole-class activity (*Class Observation*).

In contrast, the participants who held a broad educator role identity frequently used technology to boost student voices in learning. Their identification with the role of facilitator, co-participant, and supporter of student learning made them rely less on direct instruction, as exemplified in Zhang's remark, "I seldom directly teach. I often wait to see how much they already know and can apply". Accordingly, interview responses and class observations revealed that this group of participants often used technology to elicit and build on students' background knowledge and engage them in collaborative inquiry and creative work. They gave ownership to students when using content-delivery technological platforms. For instance, when using an app, Chinese Writer, to provide visual display of Chinese characters, instead of demonstrating the strokes herself, Wang invited students to the front to lead the demonstration. To put it in her words, "I always invited them to do and think together" (*Classroom Observation and Follow-up Interview*). Moreover, these participants' use of technology exhibited a greater sense of flexibility and criticality. They shared instances of using technology selectively and in a balanced manner to achieve varied instructional purposes. To Li, whether to use technology or not was determined by the need to keep the optimal learning momentum:

If students felt bored, I would use technology to provide fresh experience to sustain their attention. But if they had been using technology to do projects for a while and got tired, I would go back to traditional approaches to let them calm down a bit.

Li used technology in either student-centered or teacher-guided manner to cater to different learning needs. For instance, she often engaged her 12th graders to read up-to-date authentic resources like blog posts and news for independent inquiry, providing text-to-speech tools, pop-up dictionaries and annotation tools like InsertLearning to make the reading process interactive and well-supported. However, she seldom assigned similar tasks to 8th graders because "they needed more face-to-face interactions" and "more structured inquiry" (*Interview*). Class observations showed that, for this cohort, Li frequently used technology in the

whole-class or group learning scenarios. She was observed engaging students to work together to brainstorm and categorize ideas so that she could “demonstrate the thinking process for students ... to guide them step-by-step”. She was also observed engaging students in collecting and analyzing data and presenting the findings using Google Workspace, spotlighting peer works to draw students’ attention to aspects of effective presentation during the process (*Class Observations*).

These role identities in practice-centered frames were found to override those in contextual frames to shape the teachers’ approaches to technology integration. Lee and Jia both identified themselves as tech-savvy, who embraced the role of technology in society and loved experimenting with new technologies. Both obtained the Google Teacher Certificate and expressed strong enthusiasm for technology use (“Technology and I are closely connected” – Lee). Lee held a strong subject teacher identity, believing her primary responsibility was to “help students develop Chinese language”. She was observed to predominantly use technology to present teaching content (*Class observations*). Although she jumped to experiment with new video making software like imovie and powtoon and found them extremely easy to use, she used them only to create animated materials for instructional purposes rather than engaging students in creative language production with these tools (*Interview*). In contrast, Jia reported identifying with a semi-actor role who was responsive to students’ needs and focused on supporting student wellbeing and agency (*Interview*). She was observed bolstering student agency when using technology, exemplified in letting students create assessment items on Kahoot (*Class observations*). Similarly, Lee and Wang worked at the same school with a strong positive education policy, and both identified themselves as school policy implementer (for example, “Our school is implementing positive education. As teachers, our responsibility is to align with school mission and implement school policy”). Lee identified strongly with her subject teacher role (“Students’ Chinese learning is my primary concern, and I want to see them show progress in my class”). She interpreted her school’s positive education policy as “not to provide too much pressure on students and not to give too much homework”. Accordingly, her use of technology focused on presenting visually rich materials and sharing learning content and recorded storybooks with parents for them to follow up at home (*Interview*). In contrast, Wang held tightly onto her role as a facilitator whose responsibility was to inspire students to learn and maximize their learning potential. She interpreted positive education as providing positive feedback to students, building students’ self-esteem, and fostering lifelong learners. With this interpretation, she used the classroom management software, Class 123, not for disciplinary purposes but for positive reinforcement (for example, adding house points to students who behaved well rather than deducting the points of misbehaving students) (*Interview*). When teaching pinyin, the phonetic system of Chinese, she engaged her students in using pinyin to input stories on Book Creator, a digital storyboarding platform, to help them see the value of pinyin as a tool for self-expression and language communication (*Class Observation*). Thus, despite sharing a similar school member role, these participants embarked on different journeys of technology integration, journeys that aligned more with their role identities at the practice-centered frames.

Teacher Role Identities Shaped the Purpose of Technology Integration

A core difference between sophisticated and less sophisticated teaching role identity lay in the breadth of role identification, which shaped different motivational drivers for technology use. For participants who held a narrow subject teacher role, technology use was often driven by the need to boost either students’ learning motivation or their teaching motivation (for example, “It brought me new energy, otherwise I had difficulty maintaining interest in teaching” – Wen). Whereas, for those who held a broad educator role, technology was used to cater to diversified learning needs and make learning meaningful to students. For instance, Wang identified strongly with the role of supporting students to grow into happy lifelong learners. Accordingly, she used technology to “incorporate authentic materials and experience from daily life to help students see the connection of their learning with everyday life”. She asked her 6th graders to make a Facebook post for a famous Chinese author they were studying:

If I instructed them on the biography, the famous saying of the author, they wouldn’t care, since they did not see how it is relevant to them. But since they are all using WeChat, Facebook and Instagram in

daily life, asking them to imagine and create the Facebook friend cycle of the author would help them see the connection of what we were learning with their daily life.

Moreover, this group of participants underscored using technology to promote skills beyond the subject domain. For instance, Jia chose visible thinking tools (for example, mindmapping) over PPT, because these tools could “help students not only comprehend the text, but also develop divergent and logical thinking”. Wang’s emphasis on fostering “lifelong learners” made her focus heavily on learning strategies: she spent class time showing her students step-by-step how to search information on Google and how to operate digital storytelling apps (*Class Observation*). Similarly, during a lesson observed, when students asked for the meaning of an idiom, Li showed students which online dictionary to select and how to locate the meaning. In contrast, participants who held a narrow subject teacher identity were not willing to “waste” time on teaching goals other than language skills. Huang shared why she wouldn’t use any technological tools that her students had no prior experience with: “I need to teach Chinese. Then I need also to teach them how to use the tool. That would turn me into a tech teacher. I wouldn’t do that”. In several observed class episodes when students approached him for the meaning of new words, Wen directly provided the answers instead of teaching students word inferencing strategies.

The contrastive cases of Xu and Li’s use of multimodal composition was a telling case of how teacher role identities shaped purposes of technology integration. Xu believed strongly in her role as a Chinese language and culture teacher, and consequently when engaging her students in creative media projects, her sole attention was on language development. She was observed providing students with the outline of the poster and relevant prompts so that students only needed to fill in the relevant language content. In contrast, Li identified with the role of helping students develop skills useful in daily life. When asking her 8th graders to create a digital book about family history using an app, iBook, she deliberately added graphic and artistic design elements “as a required component in the task” because she felt these soft skills are important skills students need in the future (*Class Observations and Follow-up Interviews*).

Teacher Role Identities Shaped Teachers’ Resilience in Technology Integration

Moreover, these two groups exhibited differed levels of resilience in technology use. Participants with a subject teacher role identity emphasized teachers’ authority in managing in-class learning. They frequently expressed concerns over uncertain or disruptive situations in technology use. They regarded teachers’ familiarity with and confidence in operating a tool as a precondition for integrating it in teaching. Lee made sure that she grasped the technology first before letting her students use it, and Wen only tried the technologies that his colleagues shared “because it shows that the technologies would work in [his] teaching context”. They reported abandoning a technological solution once it did not meet their expectations. For instance, Xu commented: “if the technology made many students get distracted, or couldn’t facilitate their learning, I wouldn’t use it”.

In contrast, the participants who held an educator role identity exhibited greater resilience towards failure and reported exploring alternatives when a tool did not work out as planned. For instance, Li shared an unsuccessful experience of using Edpuzzle for an interactive video viewing task, where she found that she had to wait till students finished the whole video before making any follow-up instructional moves. However, the setback did not discourage her from continuing using this tool, but rather made her rethink about when to use this type of activity: “I wouldn’t use this activity in-class. I may ask them to use it outside the class or in other situations”. Wang shared her chaotic experience of using QuizletLive with her 1st graders, where she was bogged with troubleshooting tech problems. When asked whether she would stop using QuizletLive with 1st graders, she responded: “No, I wouldn’t. I would use this activity when I have support teachers. Then I could split students into half and provide the needed support when the group size was smaller”.

Tensions in technology use also derived from contested identities within the participants. Zhang regarded her roles in developing students’ cross-disciplinary skills as “more important than learning the content” and felt that “students need to learn how to learning”. But she also struggled with fulfilling her responsibility

of helping students achieve good grades in the Chinese subject. The contested role identities fought for class time:

Chinese as a subject has requirements on the vocabulary size, grammar and writing skills students are expected to develop, which show up in students' grades on report card. Thus, it may constrain the class time I could allocate to developing lifelong learning skills.

Although she chose to dedicate class time primarily to meet Chinese learning needs due to examination pressure, she reconciled the tension by positioning technology as a tool for self-directed learning beyond the classroom. She put a large number of technological resources on Google Classroom and showed students how to use these sites in class (*Interview*). She also played foreigner-created YouTube videos in class, which she felt explained grammar points well from learners' perspectives, and "asked students to subscribe to these channels and told them there are many more videos they can watch at home". Huang also shared an instance of struggling to balance her role of helping students excel in exams and of providing engaging, meaningful learning experiences to her students:

Although an inquiry project that involved onsite research and video shooting, on-site interview and multimodal product creation, was appealing to students, it took up a few weeks and wasted a lot of my class time. But I had all these contents to cover to get them well prepared for examination. As a teacher, I had to make a choice.

Prioritizing the exam preparer role, she decided to drop the "fun" part and keep only the language and cultural aspect, turning the activity into an overnight online research and presentation activity (*Interview*).

Interaction between Teacher Role Identity and Technology Use

Participants reported instances where their teacher role identity shifted over time, which was accompanied by changes in the nature of technology use. Li recounted a change in her role identity as a result of teaching experience. When she started teaching, she focused on the immediate outcomes of each lesson. But as she accumulated more experience in education, she started to focus more on supporting student growth as a person. She observed a parallel shift in how she put technology into use:

In the past, technology was used to draw students' attention, quite short-sighted. As I gained a clearer view of the ultimate goal of Chinese education, I used technology more to serve the most important things. My technology use was more long-term oriented.

When tapped further for elaboration, she shared her use of InsertLearning, an online annotation tool, as an example. In the past, when adding interactive questions on InsertLearning to guide students' interaction with online text, she fixated on comprehension of the text; but now, she "would pay more attention to thinking development". In a similar vein, when asked whether she experienced any changes in her espoused teaching role, Zhang responded:

Zhang: My thinking about how to teach changed. I started with lecturing only, and now it's more about learn together with students. This is one of the change.

Researcher: Ok. Did this change have any impact on your use of technology?

Zhang: Of course, it had an impact. When I select technology, I consider students' perspectives more often, what they like in particular. I pay more attention to the technological resources that can help them develop different skills. Think more about how these technological resources could enable students to meet their own needs and learn better.

At the same time, the participants also reported renewed understanding of learners and learning out of technological experiences, which further shifted teaching role identity. The local school Wen used to teach did not emphasize technology integration. But upon moving to his current school, he felt the pressure to do so. Despite using technology with reluctance at first, he was glad to find that technology use made teaching more relaxing and strengthened student-student interaction. This renewed understanding of teaching

induced his shift from a lecturer role to an instructional designer role: “I felt that now I paid more attention to the teaching design instead of relying solely on direct instruction as before. I strive for greater diversity in teaching”. This shift was reflected in his changed practice from one-way use of technology for learning management only to subsequent diversified technology use for collaborative work and peer review (*Interview*). Similarly, integrating technology in teaching made Jia develop renewed understanding about her students:

I felt that I had underestimated their abilities. I used to think that students knew nothing, so I babbled on and on. But after I used technology to engage them in collaborative work and formative assessment, I realized that they already had quite a lot of prior knowledge. Teachers’ roles are more about synthesizing, extending and elevating their existing understanding.

The renewed understanding was reflected in her shift from a director role, who planned learning content and process for students, to a semi-actor role, who responded to students’ interest and input. Her positioning of technology in teaching changed as well:

In the past, I used technology so that my class wouldn’t look bored when others visited my class. Now, because of the changes in how I view my roles in the classroom, technology became a natural part of my teaching.

Huang’s account of her technology use over time revealed how the interplay of role identities and technology use was situated in the wider sociocultural contexts. Huang used to be a technology pioneer in the Chinese language profession, leading innovative projects at school and hosting Apple certificate workshops outside school. With this internalized technology pioneer role, she engaged in diversified and student-centered technology use, such as multimodal production out of authentic online inquiry, despite her subject teacher role identity. However, her Chinese colleagues challenged her technological initiatives for taking up too much instructional hours and watering down students’ Chinese handwriting skills, and school leadership questioned the frequent use of sub teachers during Apple certificate workshops. The two identities caused tensions. Ceding to the role of a responsible team player at school, she started to downplay her tech leader role. The reduced tech leader role was reinforced by the observation that more and more young teachers were versatile in new technology use and there was no need for a tech pioneer anymore. The redefinition of teacher identity was accompanied by the shift away from school-based assessment to a standardized exam at her school. She started to emphasize her responsibility of helping students excel in exams. With this newly claimed exam preparer role, her technology use became teacher-centered, where technology was used primarily for learning management, to deliver assessment contents, and to present teaching materials in visually appealing manner. Thus, Huang’s teacher role identities and technological experience evolved with one another in response to the changing sociocultural circumstances.

Discussion

Adding to the emerging body of literature on the association between teacher professional identity and technology integration (Author & Colleague, 2021; Liu & Geertshuis, 2021), this study uncovered that teacher role identities shaped teachers’ purposes, pedagogical approaches, and resilience in technology use. The close relation between teacher role identities and the nature of classroom technology use supports the call for greater attention to teacher identity in researching and intervening classroom technology integration (Author & Colleague, 2021; Liu & Geertshuis, 2021). Supporting Yazan’s (2019) suggestion on greater attention to teacher identity in teacher education, the findings advocate that professional development initiatives on teacher technology integration heighten teachers’ reflexivity towards the relationship of role identities and technology practices (Beaumie et al., 2023; James & Lee, 2021). Teacher identities at the practice-centered frames, concerning roles in students’ learning and development, were found to outweigh those at the contextual frames, such as school policy implementers, in shaping the nature of technology integration. This finding is consistent with previous findings on language teachers’ identity in curriculum reforms (Wang et al., 2023). The finding suggests that these practice-centered identities are at the core and may potentially offset the contextual influences on classroom technology integration at the school

community and beyond. Thus, these practice-centered identities deserve particular attention in professional development initiatives.

Extending previous research findings on the positive associations of broadly defined teacher identity with either student-centered or diversified technology integration (Author & Colleague, 2021; Li et al., 2019; Richter et al., 2021), this study found that teachers who held an educator role identity exhibited greater instances of using technology to create learning experiences that are relevant to students' life, promote student ownership in learning, extend learning beyond the classroom, and foster generic learning and life skills beyond the subject matter that have long-term impacts, which are the most important aspects of a teacher's job (Popper-Giveon & Shayshon, 2017). Such student empowerment-focused technological behaviors were also observed in expert teachers in Meskill et al.'s (2012) study. This study revealed that broad educator role identification is at the core of such behaviors. The study further found that teachers with this professional identity shared a more flexible and critical mindset towards technology integration and exhibited greater resilience in technology use. The diversified and flexible approach to technology use is crucial, since myriad ways of technology use are needed on different occasions to accomplish the multifarious professional and instructional responsibilities teachers need to assume (Kopcha et al., 2020; McCulloch et al., 2018). Findings from this study suggest that fostering a sophisticated role identity that is broadly-defined, or "extended boundary orientation" in Geertshuis & Liu's (2022) words, is essential to boosting a flexible and critical approach to technology integration. To broaden language teachers' role identities, making self-espoused identities malleable through raising metacognitive awareness is critical (Yuan, 2019). Yazan's (2019) critical autoethnographic narrative approach that engages teachers to examine lived experiences from a critical standpoint, and Assen et al.'s (2018) dialogic approach that engages teachers to imagine and explore new possibilities and harmonize multiple teacher I-positions might be viable approaches. In addition, broadening teachers' cognition about the goal of language teaching, sharing teaching examples from peers who hold more sophisticated role identities, and providing "boundary crossing" experiences (Yuan, 2019), such as interdisciplinary interaction, might help broaden role identity beyond subject teacher per se.

However, teacher identity is essentially multidimensional, and tensions are inevitable. This study found that tensions in role identities imposed challenges on technology integration, and when participants failed to balance the contentious sub-identities, letting one ceding to the other, their technology use was reduced to minimum. Helping teachers to strike an equilibrium across various roles is hence essential. Therefore, it is important to treat tensions as an important "site of pedagogical intervention", and guide teachers to make sense of the identity dimensions that are in conflict (Fairley, 2020; Morgan & Clarke, 2011, p. 825). Professional development events may provide opportunities for teachers to recognize and discuss tensions in identity construction, guide teachers to imagine and act on possibilities to counter the coercive power situations encountered during technology integration, and help teachers construct new relationships among multiple roles and come up with creative solutions to reconcile the tensions and balance the sub-identities to support technology integration (Beaumie et al., 2023; Popper-Giveon & Shayshon, 2017).

This study further revealed that technology integration and teacher identity co-evolved. Having relevant knowledge and skills for and successful prior experience of technology integration was insufficient to maintain rich and flexible technology use. Instead, teachers' sense making of their experience and their teaching contexts and the concomitant self-identification exerted a stronger influence. Thus, supporting a positive interaction between technology integration and teacher identity should an important dimension of intervention in professional development initiatives. Since teacher identity changes take place discursively via social interaction with others and material interaction with objects and spaces (Barkhuizen, 2016; Foreman-Brown et al. 2023), professional development initiatives can start with either engaging teachers in discursive activities to recalibrate teacher role identity, such as guiding them to reflect on role identities and analyze how self-imposed identities have shaped their technology use, or immersing them directly in technology integration experiences, such as experimenting with a recommended technological activity and bringing observations of students' reactions and development to professional development events to discuss so as to activate the reconstruction of teacher role identity. Given that the interaction is contextually

mediated (Fan & de Jong, 2019; Gu & Benson, 2015), to facilitate a positive cyclical interaction between technology use and teacher role identity, it is equally important to guide teachers' interpretation of their technological experiences in relation to the professional contexts, making sense of both the contextual circumstances and relationships and the knowledge and attitudes acquired in these contexts (Beaumie et al., 2023).

Limitations and Future Research

This study has a few limitations. First, the study was conducted with a group of K-12 Chinese language teachers in international schools with greater curriculum freedom, good technological infrastructural and positive school culture on technology integration. As the relationship of identity and teaching practice is subject to the contextual circumstances (Fan & de Jong, 2019; Gu & Benson, 2015), the prominence of teaching role identity in technology integration and the observed link between sophisticated teaching identity and diversified, flexible and resilient technology use may show up differently in teaching contexts with different curriculum and technological situations. It is possible that the observed link might be weaker in school contexts where technological infrastructure is less optimal or curriculum structure is more rigid, or stronger in higher education contexts where there are reduced high-stake exam pressure and peer conformity pressure. Moreover, the study was conducted with Chinese language teachers in Hong Kong context, a disciplinary context with a strong emphasis on subject knowledge and a cultural context where social conformity is strong. These contextual characteristics might have shaped the specific nature of contested identities, which might manifest differently in other disciplinary contexts and sociocultural contexts. Thus, the same research issue needs to be investigated in different sociocultural and teaching contexts. Second, the study has several methodological limitations. One limitation is the small sample size, which confines the findings to an exploratory level at best. Another limitation is the research design. Although the study used multiple data sources, the qualitative nature of the study constrained the generalizability of the research findings. Future research may expand the sample size and adopt mixed method approach to both test the observed associations via quantitative data sources such as survey responses and reveal the nuanced insights into complex interplay in specific contexts via qualitative data sources. Moreover, insights into the two-way interaction between identity and technology use was based on retrospective interview responses only, which are susceptible to potential biases and inaccuracies. Future research may adopt a longitudinal design to trace the co-evolution over time through a combination of self-report and observation. Third, the data were collected in 2019, prior to the onset of emergency remote teaching. Witnessing students' self-directed learning with technology during remote teaching might have shaped teachers' cognition on role identity and technology use. Similar studies among the post-pandemic teaching force and in the GenAI era are needed to yield richer insights into the interplay of teacher role identity and technology integration.

Conclusion

This study examined the relationship of eight K-12 language teachers' role identities and classroom technology integration. It found that teacher role identities shaped the purposes of, pedagogical approaches to, and resilience in classroom technology integration. Moreover, contested teacher identities interacted with the nature of technology integration in a cyclical manner. It underscored the importance of a broad educator identity in diversifying and fortifying technology integration. The findings suggest the significance of teacher role identities in understanding classroom technology integration, and advocate that developing sophisticated teaching role identity that is broadly- and flexibly-defined is an essential component of professional development initiatives on teacher technology integration.

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Appendix A. Interview Protocol

【teaching backgrounds】

1. Please introduce your teaching backgrounds (prompts: educational backgrounds, teaching experience, teaching contexts)

【Role identities】

1. How would you describe yourself as a teacher?
2. How do you view your roles in teaching? How is that reflected in your teaching practices outside the classroom?
3. How do you view your roles in the school community?
4. How do you view your role in the Chinese language teaching profession and community? What role do you aspire to play?

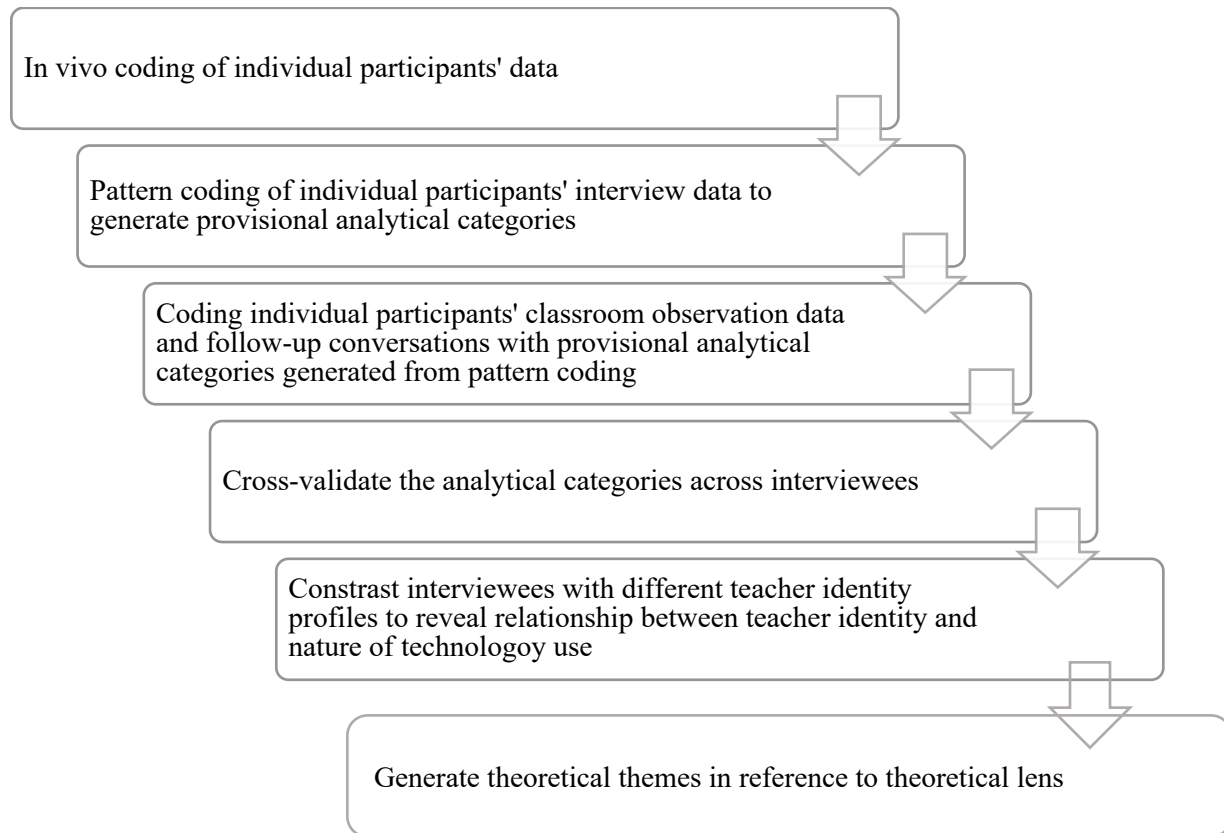
【Nature of Technology Use】

1. Please give a few representative examples of your use of technology in teaching? (prompts: what context? for what purposes? Considerations in selecting the technological resources and tools? Considerations in using the resources and tools?)
2. What concerns do you have in using technology in teaching?
3. How do you view your relationship with technology?
4. Do any of your perceived roles as a teacher (in teaching, at school community, and in the professional community) have any relationship with your use of technology in teaching? If yes, how are they related to one another? Any instances where different roles cause tensions in technology integration decision making?

【Changes of technology use and identity over time】

1. Reflect on your technology integration experience over the years, could you draw a line to indicate different stages in your classroom technology use and annotate the critical incidents?
 2. Please describe how your use technology in each stage and illustrate with examples
 3. How were your perceived roles (in teaching, at school, in the professional community) at that stage?
- Do you have anything to add in relation to what we discussed just now?

Appendix B. Interview Protocol



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