Castledown

OPEN ACCESS

Technology in Language Teaching & Learning
ISSN 2652-1687
https://www.castledown.com/journals/tltl/

*Technology in Language Teaching & Learning, 7(3),* 103221 (2025)
https://doi.org/10.29140/tltl.v7n3.103221

# Technological Interventions and Language Teacher Immunity: A Narrative Inquiry into Triggers and Coping Strategies

SARA HAGHI[a*]
MUHAMMAD JAFARPOUR[b]
MOHAMMAD BEHROOJEH[c]
JABER KAMALI[d]

[a]*Department of English Language, Kermanshah University of Technology, Kermanshah, Iran*
Sarihaghi@gmail.com

[b]*Faculty of Literature and Humanities, Department of English Language & Literature, Urmia University, Iran*
jafarpour.muhammad@gmail.com

[c]*Faculty of Letters and Humanities, Ferdowsi University, Mashhad, Iran*
masterbehrooj@gmail.com

[d]*School of Languages, Ibn Haldun University, Istanbul, Turkey*
Jaber.kamali@ihu.edu.tr

## Abstract

Language teacher immunity, as a coping mechanism for managing professional tensions and stressors, has gained increasing relevance due to the growing integration of technology in the classroom, which presents teachers with new and complex challenges. This qualitative case study explores the impact of integrating technology tools on three in-service language teachers' immunity. To do so, this study employed the narrative inquiry method by asking participants to complete narrative frames first to investigate their personal stories and experiences in detail. To corroborate the data, reflective journals were kept consistently over three months (i.e., one instructional semester), and follow-up narrative interviews were conducted. The data were analyzed to identify recurring themes regarding triggers and coping strategies. The findings highlight three major triggers, namely educational, contextual, and learner-related factors. Teachers faced issues such as lack of preparation time, inadequate training,

outdated equipment, and limited internet access, all of which disrupted their teaching practices. To mitigate these challenges, they adopted various coping strategies, including personal preparation, peer collaboration, and utilizing personal technology. The study concludes that addressing these challenges not only restored equilibrium in the teaching process but also positively influenced the teachers' professional identity, enhancing their resilience and adaptability in technology-enhanced learning environments.

*Keywords:* language teacher immunity, case study, thematic analysis, techno-immunity

## Introduction

Language Teacher Immunity (LTI) specifies "a robust armoring system that emerges in response to high-intensity threats and allows teachers to maintain a professional equilibrium and instructional effectiveness" (Hiver & Dörnyei, 2017, p. 669). This medically-coined term was initially created by Hiver (2014) as he aspired to liken the teacher immunity concept to the psychological reactions of the human body, which would jointly form a defensive system against possible hazards. Likewise, LTI, known as a psychological repertoire, is constructed over time and language teachers can benefit from its underlying strategies to effectively cope with their job-related tensions (Li, 2022).

Being fraught with numerous challenges and complexities, the language teachers' context of practice would impose various menaces on them (Pourbahram & Sadeghi, 2020). However, as Wang et al. (2022) put it, providing that English as a Foreign Language (EFL) teachers are equipped with LTI, they can stay resilient coping with job-related hurdles, manage their emotions skillfully, and enhance their instructional efficiency. Moreover, immune language teachers are able to re-establish the disrupted equilibrium in the classroom (Rahmati et al., 2019), show great interest in English language teaching (Yuan & Zhang, 2017), and identify themselves as autonomous instructors who enjoy high levels of engagement (Jiang et al., 2024). Recent advancements in the domain of technology and the positive impacts of using it in language teaching (e.g., Isisag, 2012) have created an increasing demand for teachers to integrate technology into their instructional practices (Yenkimaleki & Van Heuven, 2019).

Despite the popularity of technology in the teaching process, educational settings are not equally equipped with these innovative devices (Al-Senaidi et al., 2009) and language teachers do not have the required technological pedagogical content knowledge (Raygan & Moradkhani, 2022; Tseng et al., 2020; Wilson, 2023) which is necessary for overcoming technical mishaps (Ozgur, 2020). Further studies have found factors like techno stress (Joo et al., 2016), insufficient technical and pedagogical backup (Wallace et al., 2023), deficiency in technical infrastructure (Taghizadeh & Ejtehadi, 2021), language teachers' internal resources such as low self-confidence (Aydin, 2012), cynical perceptions of technological utility (Acosta-Enriquez, 2024), and the inadequacy of the related teacher training courses (Moser & Wei, 2023) as impediments to technology integration in the educational context.

Technology integration is significantly affected by the instructors' context of practice (Raygan & Moradkhani, 2022). More importantly, in the context of the current study, Iran, where English is officially taught in either public or private sectors, instructors are facing challenges with the inadequacy or unavailability of technical tools (Hedayati & Marandi, 2014). Although previous studies have considered barriers to the implementation of technical tools in educational settings (e.g., Kastner, 2020), they have not yet, to the best of our knowledge, considered these barriers as a possible threat to teachers' immunity. Thus, this study is an attempt to unveil the developmental processes EFL teachers go through to build up their immunity against technology-related stressors.

## Literature Review

### Theoretical Foundation

Hiver (2014) set forth the term teacher immunity, drawing inspiration from the concept of biological immunity inherent to physiological theories. However, the basic underpinnings of this concept are established upon Complexity Theory (CT; Larsen-Freeman, 2012), based on which dynamic systems are capable of adapting their interior design and all-inclusive operation in reaction to nonresident factors triggering the system's repose through a process known as self-organization (Benzhaf, 2009). Later on, Hiver and Dörnyei (2017) further developed and expanded the concept of LTI to the realm of language instruction. Accordingly, individuals are able to build up this adaptive mechanism through four stages: triggering, coupling, realignment, and stabilization (Hiver, 2017). While the first two steps highlight the system's reactionary mechanism, the two latter concepts allude to an upper-level adjustment in the entire arrangement.

Triggering has to do with the perturbations that dislodge a system from its self-organized condition. It is noteworthy that the relationship between the size of a disturbance and its impact is non-linear. That is to say, oversized external pressures may lead to minor inconvenience, while trivial interferences might stimulate forcible responses. For instance, a student's misbehavior might be a source of disturbance for teachers as it wreaks havoc on the classroom management process. The coupling stage refers to the mechanisms adopted by the system's units to reverse the impacts of the triggers to their own ends. For example, a teacher may decide to assign more responsibilities to a trouble-making student to build up a sense of belonging and accountability in him/her. As Hiver (2017) put it, during the coupling stage, language teachers are able to adjust themselves to the circumstantial restrictions and retake their self-efficacy. The subsequent phase, realignment, implies the reappearance of the system's efficiency and the emergence of newly developed conducts. Finally, yet importantly, the system is enabled to maintain its given label and internalize the recently developed behavioral patterns. By doing so, its professional identity would be endowed with the consequences of the attained achievements.

In an attempt to conform to the stages of teacher immunity, Hiver (2017) asserted that EFL teachers' immunity comprises specificity (the ability to adopt certain coping tactics to particular triggers), memory (relying on the relevant former experiences of exposure to similar stressors), adaptability (the ability to become productively habituated to the subsequent changes), and durability (incorporating the acquired experiences into the teachers' identity). Teacher immunity, as an empowering mechanism which can help individuals "bridge their concerns with wider contextual conditions," has two major types: productive and maladaptive (Hiver & Dörnyei, 2017, p. 407). Once built up, productive immunity can buffer teachers from teaching-related stresses and enhance their instructional effectiveness. It further contributes to the maintenance of the educators' equilibrium (Hiver & Dörnyei, 2017). On the contrary, maladaptive immunity reduces the teacher's instructional effectiveness, impedes their development, and eventually results in burnout (Hiver & Dörnyei, 2017).

### Antecedents of Language Teacher Immunity

Hiver (2014), a pioneer in teacher immunity, explored the development of teacher immunity in four Korean language teachers through semi-structured interviews, revealing that productive immunity fosters accomplishment, while counterproductive immunity leads to stagnation. Later, Hiver (2017) used a retrodictive qualitative modeling approach with 44 teachers and trainers to identify immunity patterns, including self-efficacy, resilience, burnout, and openness to change. A subsequent questionnaire for 293 teachers identified four immunity categories: productively immunized, maladaptively immunized, immunocompromised, and halfway immunized. Inspired by Hiver's findings, Rahmati et al.

(2019) examined immunity triggers and coping strategies in 15 EFL teachers, highlighting challenges like low self-confidence, demotivated students, and limited resources, and strategies such as preparation, rapport-building, and parental discussions.

Haji Jalili et al. (2023) carried out a mixed-methods research study on EFL teachers' immunity in both the public and private sectors. The results indicated that language teachers who work in the private sector are troubled with meager teacher immunity compared to their counterparts. The underlying reasons for this deficiency were mentioned to be scant supervision on the part of the Ministry of Education, loads of jobless individuals in society, administrators' greed to make more profit, and underestimating the importance of schooling. In another study, Khazaeenezhad and Davoudinasab (2022) made an attempt to identify the relationship between language teacher immunity and EFL teachers' personality types. This mixed-methods study was conducted on 50 participants in the quantitative phase and eight individuals in the qualitative stage. The obtained results yielded a positive correlation between teacher immunity clusters and teachers' personality types.

### Language Teacher Immunity and Technology Integration

Given that incorporating technical tools in the instructional processes has been considered useful from different perspectives, language teachers have been increasingly compelled to employ these technologies to upgrade their educational tier (Yenkimaleki & Van Heuven, 2019). Nonetheless, the utilization of technical resources has not been devoid of adverse repercussions for educators.

Fathali et al. (2024) found that EFL teachers with low digital literacy are more susceptible to technical, pedagogical, and social anxiety, leading to reduced self-confidence and organizational skills, which may threaten teacher immunity. Similarly, Rahimi and Tafazoli's (2022) study revealed a positive correlation between teachers' digital competence – such as collaboration, content creation, and problem-solving – and their optimistic views on technology integration. Cahyono et al. (2024) explored the impact of the sudden shift to virtual learning during Covid-19, highlighting challenges like student engagement, assessment, and resource knowledge. They noted that teachers favor practical and user-friendly tools, such as FlipGrid, even post-pandemic. Unlike these studies, the current research focuses on post-pandemic face-to-face classrooms, examining technology-related challenges, coping strategies, and their potential effects on teacher identity (Kamali et al., 2024; Satvati et al., 2025).

The incorporation of technology in language instruction has markedly altered pedagogical practices (e.g., Hedayati & Marandi, 2014; Sabiri, 2020), yet it has also introduced several challenges, especially regarding adaptability and resilience, thereby highlighting the notion of teachers' immunity. Nevertheless, to our knowledge, few studies have established a connection between teacher immunity and technology integration. Gooran et al. (2023) performed a mixed-methods study to ascertain the correlation between EFL teachers' immunity in an online teaching environment and their levels of Technological Pedagogical Content Knowledge (TPACK) and engagement. The gathered data indicated that "variations in teachers' immunity were primarily attributable to familiarity with online instruction, skepticism towards online learning, and restricted student engagement" (p. 908). Additional evidence regarding the potential effects of language teachers' involvement in telecollaboration contexts revealed that such environments can enhance teacher resilience by offering a supportive network of colleagues and promoting a sense of community and collaboration (Dooley & Sadler, 2020; Yazan et al., 2023). The present study is an attempt to bridge the alleged gaps and inquire into the aftermath of technological interventions on language teachers' immunity by proposing the following research question:

> How do Iranian EFL teachers build up their immunity in response to probable technology-related perturbations?

## Method

### Research Design

The exploratory nature of the research question led us to opt for a qualitative orientation in the current study. This study qualifies as a phenomenological case study considering that it focuses on an in-depth examination of a specific, bounded system which is the experiences of three in-service language teachers integrating educational technologies within private language institutes in Iran. The research explores the complex, contextualized interactions between these teachers and the technological tools they use, providing a detailed, holistic understanding of the phenomena. The researchers took advantage of narrative inquiry (Connelly & Clandinin, 2006) research methodology to collect the required data.

### Context of the Study

English language education is provided in two different contexts in Iran; public schools and private language institutes. While the primary goal of English language instruction is to achieve a survival level of communication in state-run schools (Farhady & Hedayati, 2009), most of the private sector's attendees pursue pivotal goals such as taking part in high-stakes tests like, the IELTS (Zhang & Rahimi, 2014).

The present study was conducted in a private sector context where students voluntarily enroll in classes (Haghighi & Norton, 2017). Some classrooms in well-known institutes, mostly located in affluent neighborhoods, are equipped with smart screens, video projectors, computers, and free Wi-Fi. The number of students in each class does not exceed 20 individuals. As the number of enthusiastic students continues to increase and educational technologies become more integrated into the instructional process, teachers are expected to meet their students' needs and satisfy both the learners' parents and institutional authorities. However, implementing educational technologies may pose some problems for teachers and challenge their instructional approach. Instructors come from an educational system in which instructions were mostly book-bound and they rarely had access to databases, which may consequently provoke some unpredictable reactions.

### Participants

Three in-service language teachers, who were teaching in a private language institute at the time of the study, were solicited and chosen for participation via convenience sampling (Creswell, 2009) by the primary researcher, who was concurrently collaborating with them in the same center. According to Creswell (2007), studies adopting a narrative inquiry approach can "focus on one, two, or three individuals" (p. 214). All the participants had at least three years of teaching experience, which is why they are called in-service teachers (Weiland, 2021). The three instructors, Ali, Maryam, and Reza (pseudonyms), were born in Kermanshah, a city located in the western part of Iran. The first researcher who was working with them at the time of the study invited them, and they eagerly accepted. It was assumed that the teachers would overtly unwrap their perceptions of the pleasant and unpleasant classroom experiences in an intimate atmosphere with the first researcher.

Among the three participants, Ali was a 33-year-old language teacher who had just graduated from a reputable university and received his M.A. degree in Teaching English as a Foreign Language (TEFL). He had been teaching English courses for more than 10 years in well-known institutes. As he explained, all these centers were more or less equipped with screens, and DVD players and instructors were supposed to implement them while teaching.

Maryam was a 37-year-old teacher who had been teaching English for about 13 years. She held an M.A. degree in English literature. She said that she had started her job in a semi-governmental language learning center where the performance regarding technology implementation was not regularly observed, and no one felt responsible for repairing or upgrading the existent devices. When she moved to her current workplace 8 years ago, she described the technological tools as forward-looking and in vogue. During peer observation sessions, she was exposed to teaching by the use of these tools. The administration unit had also emphasized the importance of utilizing the tools for displaying audio-visual aids (AVA).

Reza was 30 years old. He held an M.A. degree in TEFL and had commenced his career in English language teaching when he was 22 years old. His current workplace was the only place he had been working at; thus, he was familiar with teaching along with technological tools. Additionally, he came to describe himself as tech-savvy and interested in learning more about modern technology. As he mentioned, he did not confine himself to a set of rules in his workplace. Instead, he constantly sought new ideas and implemented them.

Concerning ethical considerations, participants were apprised of the study purpose and their voluntary involvement, allowing them to withdraw at any time. They were also afforded the option to refrain from answering questions they deemed personal. Participants' anonymity was preserved through the assignment of pseudonyms and the modification of any identifiable markers.

### Data Collection

The first phase of data was collected through narrative frames which encompassed key initiatives that led the participating teachers to unveil their experiences and perceptions to the researchers (Greenier & Moodie, 2021). For the second phase of the study, the first researcher explained the journal-keeping process to the participants to complete over three months, from January to March 2024. Language teachers selected three technology-integrated sessions from the semester and reflected on their experiences, describing the sessions, challenges faced, their responses, and strategies for similar future scenarios.

After gathering and analyzing data from the earlier stages, ambiguous assertions and insufficient explanations were identified, leading to the design of interview questions. These questions provided deeper insights into participants' engagement with educational tools and aligned with the four stages of self-organization in CT (triggering, coupling, realignment, stabilization) (Hiver, 2015).

### Data Analysis

Once the data from the three phases were collected, they were transcribed verbatim and returned to the participants to ensure the member-checking phase (Cohen et al., 2007). Following that, the available data were analyzed in two stages. In the first stage, researchers reviewed the data to understand classroom dynamics and teachers' responses to challenges in technology-equipped classes. In the second stage, following Merriam's (2009) inductive approach, transcripts were analyzed in three stages: identifying meaningful segments on teacher challenges, responses, and identity impacts; sorting similar notions; and labeling categories. The process was guided by CT components. To ensure inter-rater reliability (Gass & Mackey, 2000), an independent research assistant categorized the data single-handedly and examined his/her classification against the existing one. In the end, discordant points were resolved through discussion.

## Findings

This section discusses the technology-related stressors that disrupted language teachers and examines the strategies they employed to self-organize and adapt to a complex system. It evaluates the effectiveness of these strategies in restoring balance and how the resulting outcomes have been solidified into their professional identity.

### Technology-Related Triggers

Drawing on Hiver's (2014) notion of complex systems' self-organization, some perturbations are required to displace a system from an equilibrium state. Analyzing the obtained data brought three types of technology-related triggers known as educational, contextual, and learner-related factors to light.

With regard to educational factors, lack of time for prior technology-oriented classroom preparation, which results from the intensity of the syllabi, would propagate tension among teachers as they "have to cover approximately 40 pages, along with the related contents from two additional side books, in just 16 sessions" (Reza, interview). As the teachers asserted, the onus of designing the technology-integrated materials per session was on them. Not being able to do so on account of a high workload would create an unpleasant feeling for them. They further expounded on the importance of time and alluded to some criteria such as lack of time to search for related websites to choose suitable visualizations and create topic-based content, which would bring about a plethora of challenges.

> *I teach at least three classes of different proficiency levels every day. I have to create PowerPoints, download videos, and essential visualizations daily. If I ignore one of them, my teaching process would not be satisfactory, both for me and my learners.* (Maryam, interview)

These difficulties, for example, might include having to deal with demotivated learners who have been exposed to monotonous teaching for 90 minutes. As Ali puts it; "whenever I am book-bound in class, my students feel extremely bored. I can vividly see it in their level of participation and responses to the tasks. I feel insufficient and outdated in those moments" (Ali, interview). As participants admitted, it was not always a matter of intensive syllabi but rather a weakness in teacher training courses. In other words, teacher training courses are saddled with presenting theoretical knowledge when it comes to the importance of integrating technology. Trainers provide pre-service or in-service teachers with an introduction to the significant aspects. For example, when the sessions are "supposed to be about the utilization of technical tools in language classes, the trainers only provide superficial information" (Maryam, interview). Insufficient practical training in this domain poses a serious threat to teachers, as they are sometimes unaware of how to develop purposeful tasks using available online websites. Lack of knowledge in this regard can result in low-quality and tedious lesson plans, as teachers have to rely on repetitive tasks in every session. This would trigger teachers' self-efficacy as they "do not know how to make some variations through incorporating authentic materials in their teaching" (Ali, journal).

The terminal educational factor mentioned by participants was the importance of implementing technologies to evaluate language teachers' performance by supervisors. Observation sheets in private language institutes encompass various elements, one of which is the ability to use technology purposefully in class. As teachers averred, being assessed based on a criterion for which you have not received sufficient training would undoubtedly create unease and discomfort. For example, Reza explained that he had received negative comments since "the videos played were not aligned with the lesson's goals" (Reza, interview).

Concerning contextual factors, working with out-of-date and obsolete tools in classes was found to create an overflow of challenges for the teachers. According to the provided data, teachers were unable to complete every stage of their lesson plan due to technical disrepair. Although these technical issues originated from the administrative unit, teachers felt powerless if they were unable to fix the existing problems. Given that such situations are fraught with stress, teachers conceded that they had experienced plenty of tension and anxiety "when they had made copies of their files onto their Flash Drive, but could not show their files to the class" (Maryam, journal). Ali also highlighted the obsolescence of the screens by describing that "students cannot see what I am showing them clearly and I have to explain the visuals verbally!" (Ali, journal). A further source of perturbation was known to be a lack of technical support on the part of an expert in the teachers' workplace. Feeling unsupported in the case of complex technical mishaps would leave them helpless which leads to "losing the classes' instructional time" (Reza, journal). Two final sources in this regard were known to not have access to high-speed internet and academic websites due to government policies and sanctions, respectively. Teachers believed that these limitations have imposed extra expenses on them as they "have to pay for the internet, VPNs, and educational websites' accounts' themselves" (Maryam, interview).

Lastly, the student-related perturbation was identified as the way in which the students dealt with technology-integrated materials. Teachers averred that some of the students were unwilling when materials were played on the screen. They believed that their reluctance would have an impact on their motivation to incorporate more tech-based tasks in their classes. They further mentioned that this reaction might have its roots in the way they are instructed at school, "devoid of technology and merely book-bound" (Ali, narrative).

### Coupling Strategies

Given that the technology-related stressors have caused perturbations for teachers, they have alluded to opting for certain coping strategies to deal with them. The coupling strategies are assorted under the same categories of educational, contextual, and learner-related factors.

To deal with the first perturbation, lack of preparation, which has its roots in institutional policies and planning, the teachers claimed that they would either sacrifice their free time to put a technology-based lesson plan together or ask for a seasoned colleague's advice on the best way to hold the session. In this case, the collegial atmosphere dominating their workplace would facilitate the accessibility of the required lesson plan and its complementary material.

> *For example, you know, … when I am pressed for time and cannot plan (download videos and images) for my succeeding session, I know that I can count on one of my experienced colleagues who has the best relevant material.* (Reza, journal)

Participants further gave an explanation of times when they "slept very few hours just to avoid looking like a naïve teacher who has nothing to rely on except the book content" (Ali, narrative). Three important coupling strategies were adopted for encountering the theoretical content of teacher training courses. Maryam believed that as soon as she figured out that she could not implement what she had learned about technology use, she made a new decision and invested effort in verifying her knowledge gap through other available external sources. She enrolled in a technology integration workshop "willing to pay for it despite the fact that the training team was to blame for not arranging sufficient practical sessions for the trainees" (Maryam, interview). Additionally, Reza claimed that he had sought support from his co-workers to compensate for his lack of knowledge in this regard. However, he emphasized that he has "really supportive colleagues and can rely on them designing lesson plans" (Reza, journal). To buffer his stress against this educational trigger, Ali stated that he did not have sufficient time to

take on a new course. He characterized himself as a "quite introverted" (Ali, interview) individual, preferring to avoid seeking assistance from others for his classes. Consequently, he relied heavily on his own efforts, utilizing resources such as YouTube to gather and integrate ideas.

When it comes to contextual perturbations, all three participants conceded that although the responsibility for updating the educational tools lies with the institute's investor, handling this requires budget provision. Therefore, they would rather exercise agency and use their personal laptops despite "being bulky and heavy" to hold the class devoid of any technical disturbances. In response to the potential upcoming technical disturbances, Maryam asserted that she would seek help from one of her colleagues who is a "techie person and can puzzle out the problems" (Maryam, interview). Trying to rule out the detrimental impacts of working with obsolete devices, Ali found the discussions among his colleagues at the monthly teachers' meetings to be very constructive. He declared that teachers can expound their challenges and listen to others' experiences or viewpoints on this matter. This would certainly breed new ideas as they "shared common concerns and achieved a consensus" *(*Ali, interview). To tackle issues related to accessibility to high-speed internet and pedagogical websites, teachers have decided to compensate for this restriction by paying for it from their own salaries because "the manager does not agree to allocate a certain amount of budget to internet provision" (Maryam, journal). On the other hand, Ali mentioned that "purchasing premium accounts with our low currency value costs a fortune" and he would rather not bring any worksheets to the class (Ali, interview).

When it comes to coping strategies used to tackle learner-related triggers, Maryam adhered to "exercising variety" (Maryam, interview) in the teaching process and emphasized that she prefers "not to follow the same routine every session" (Maryam, journal). Additionally, Reza declared that "observing signs of dissatisfaction on learners' faces is an enlightening sign of shifting to an alternative plan" (Reza, interview). However, Ali took a different stance and believed that "teachers are not responsible for all students' feelings which seem to be higher compared to the previous generation" (Ali, journal).

### Realignment Stage

At this stage of self-organization, teachers were asked about the effectiveness of the strategies implemented to maintain their internal stability. As Hiver (2014) put it, when teachers are able to act upon certain disruptions and recapture their productivity, the system (teacher in our case) would begin to restore its functionality. Over time, teachers would accumulate a worthwhile supply of strategies that they can rely on in the face of prospective triggers.

All three teachers explained that they are more or less familiar with the perturbations occurring in their workplace. Therefore, they know how to manage and regain the control of their performance in order to maintain their efficiency. This finding is confirmed by what Maryam asserted regarding "the possibility of predicting the upcoming difficulties deriving from years of teaching experience in the current workplace" (Maryam, interview) and touches upon the fact that resorting to the repertoire of already-tested coping strategies can reestablish the system's (teachers' performance) strength.

Being aware of the teaching job, Reza emphasized the importance of "maintaining a positive attitude" (Reza, Journal) and knowing that "if nothing happens and we work within the confines of our comfort zone, we would lose chances of development" (Reza, interview).

What all the teachers unanimously believed in was the significance of confronting adversities in their careers. These are, in fact, turning points through which teachers can build up their internal stability. These assertions remind us of Hiver's (2014) assertion that settled teachers are made, not born.

### Stabilization Stage

The final stage in a system's self-organization process is the time when teachers assimilate the acquired experience into their identity and expand their implicit knowledge in this regard (Hiver, 2014). The newly gained knowledge is, in fact, the inevitable consequence of being involved in teaching-related perturbations. This stage, which leads to the emergence of teacher immunity, can be either productive or maladaptive (Hiver, 2014). In this case, participants who have developed productive immunity described themselves as innovative, resilient, efficient, and determined teachers in their career lifespan. For instance, Maryam described herself as "adaptable in the face of challenges" and a teacher who "view problems as opportunities for betterment" (Maryam, journal).

Given that years of experience and the synergistic atmosphere at institutes can have a positive impact on proliferating both innovation and determination, Reza highlighted that "being able to resolve the troubles has made me more determined in pursuing my career-goals" (Reza, interview). In the same line, Ali described himself to be "more creative" compared to the day he started his career since he has made attempts to sort out the conflicts through "self-study, searching databases, and listening to other experts in my career domain" (Ali, narrative).

## Discussion

The current study aimed to investigate the plausible impacts of implementing technical tools on a sample of three language teachers' immunity. The obtained findings revealed four main categories of data, with the first one being the kind of disruptions that teachers encounter while teaching with technological tools. The perplexities emerged into educational, contextual, and learner-related factors.

As for the educational factors, lack of time to prepare technology-integrated content for classes in advance might dislodge language teachers from their comfort zone, albeit this was claimed to be rooted in a high workload level. This finding was verified by a number of researchers (e.g., Hiver, 2017; Pourbahram & Sadeghi, 2020) who reported that a lack of time would trigger certain disruptions. Moreover, practical deficiencies in the extant teacher training courses would dispose teachers toward subsequent disturbances. This finding echoes Tseng et al.'s (2020) position that teachers need to be equipped with technological pedagogical content knowledge (TPACK) to use the available technology effectively. In congruence with the findings reported by Fathali et al. (2024) and Ozgur (2020), language teachers alleged that not being professionally trained on the implementation of technical tools triggered their dissatisfaction and hindered the provision of desired learning. Additionally, having to be assessed based on the successful implementation of the technology while teachers were not sufficiently trained created a nerve-wracking condition for the teachers. Likewise, the existing literature substantiated that language teachers are required to incorporate technology into their instructional practices (Yenkimaleki & Van Heuven, 2019). However, prior to assessing language teachers, they have the right to receive the required training through technology-oriented teacher training courses, a finding confirmed by Wilson (2023).

With regard to contextual factors, having to work with obsolete tools that repeatedly break down would leave teachers in a state of anxiety. The negative impact of lack of time and resources on technology integration in classrooms was also reported by Al-Senaidi et al. (2009). Since teachers do not have access to the latest devices and are confined to old-fashioned tools, recurrent technical challenges are unavoidable. Teachers attributed their feelings in this regard to the imprudence of the administrative unit. An additional source of contextual discomfort was known to be the inconvenience caused by the absence of a technology expert in their workplace. As teachers feel that they are not backed up in the face of forthcoming challenges, they would undergo apprehension. Similar

studies (e.g., Wallace et al., 2023) found that a lack of technical support in teachers' workplace would build up a barrier in the way of technology implementation.

The last factor causing disturbances for language teachers was found to be inaccessibility to high-speed internet and inability to access academic websites as a result of the extant national policies and international sanctions. This finding lends further credence to Hedayati and Marandi's (2014) study, which recognized internet connection problems as a serious constraint among language teachers. The last source of perturbation was attributed to the students' reluctance toward technology-integrated content. Teachers speculated that this could be due to the kind of book-bound instruction they received at state schools. Previous studies (e.g., Acosta-Enriquez, 2024; Rahmati & Tafazoli, 2022) have also recounted that learners' attitudes toward technology would directly impact their interaction with it. Apparently, students' reactions would trigger teachers' perturbations if they do not align with the teachers' technical efforts.

To alleviate the tension-breeding impacts of perturbations, teachers took advantage of a number of educational, contextual, and learner-related factors. In order to address the educational disturbances, teachers stated that they would either dedicate their free time to designing a lesson plan or request lesson plans from their experienced colleagues. In a similar vein, Yazan et al. (2023) claimed that tele-collaboration as a collaborative learning tool is now a reality by virtue of technology implementation. Thus, teachers have a chance to share their knowledge with one another via communication channels. To overcome the limitations of teacher training courses, teachers implemented several strategies. For instance, they attended relevant workshops, sought advice from their co-workers, and searched online. The efficiency of this solution was substantiated by Moser and Wei's (2023) study which found that teachers can improve their TPACK by taking up online workshops and training sessions in this regard.

To mitigate the distress caused by contextual factors, teachers declared that they would rather take their personal laptops to class and avoid possible technological disrepair in the classroom. Previous studies (e.g., Cahyono et al., 2024; Raygan & Moradkhani, 2022) have found that if teachers have limited access to technology, they develop a negative attitude toward technology integration. However, participants in the current study revealed that they are aware of the constructive impacts of technology implementation and would rather not deprive students of this blessing. Therefore, they decided to exercise agency and use their personal laptops. Meanwhile, they found discussions in the teachers' room on the existing technological shortcomings and feasible ways of solving them quite helpful. In contrast to the study by Raygan and Moradkhani (2022), which found no relationship between language teachers' technology integration and the school climate, participants announced that the synergic atmosphere of the staff room has helped them overcome the barriers to technology integration and foster their immunity.

Additionally, to manage the issue of internet and academic website accessibility, teachers had reluctantly accepted paying for an account themselves. This finding aligns with the research conducted by Taghizadeh and Ejtehadi (2021), which emphasizes the impact of deficiencies in the technical infrastructure. Their study identifies this inadequacy as a tension-breeding condition. Finally, to address the learners' reluctance toward tech-based content, teachers took advantage of incorporating variety in their tasks and shifting to a second plan in the case of low involvement. The effectiveness of this strategy was highlighted by Isisag's (2012) study in which the variety embedded in technology tools can make learning a great pleasure for students and create a student-centered learning environment. However, one of the participants believed that ignoring such learners would be the best choice.

Teachers reported that implementing strategies to regain equilibrium allowed them to manage future disturbances effectively and take control of their systems. As their experience grew, their strategies

became more effective, aligning with literature suggesting that LTI enhances resilience and balance restoration (Rahmati et al., 2019; Wang et al., 2022). The effectiveness of coupling strategies supports Hiver's (2014) findings, where teachers first adopted strategies and then adapted their methodologies, incorporating challenges as part of their professional growth. Participants identified themselves as innovative, resilient, and efficient, mirroring Hiver's conclusion that the stabilization stage integrates these experiences into teachers' identities.

## Conclusions and Implications

This study examined the influence of integrating technology tools on the immunity of three in-service language teachers. Through narrative inquiry (frames and interviews) and reflective journals, we explored their personal experiences and coping mechanisms. The findings revealed significant triggers stemming from educational, contextual, and learner-related factors. Challenges such as a lack of preparation time, inadequate training, outdated equipment, and limited internet access were prevalent. Despite these hurdles, the teachers employed various strategies, including personal preparation, peer collaboration, and leveraging personal technology, to maintain their teaching efficacy. Ultimately, these adaptive measures not only restored balance in their teaching practices but also fortified their professional identity, fostering greater resilience and adaptability in technology-enhanced learning environments.

The findings highlight the critical need for comprehensive support systems to assist teachers in integrating technology effectively. Educational institutions must prioritize continuous professional development to ensure teachers receive adequate training and resources. By addressing infrastructural issues such as outdated equipment and unreliable internet access, schools can create a more conducive environment for technology-enhanced learning. Additionally, fostering a collaborative culture among teachers can enhance peer support and shared problem-solving, further strengthening their professional immunity.

While this case study offers valuable insights, its scope is limited by its small sample size of three teachers, affecting the generalizability of findings. The qualitative approach, though rich in detail, may not encompass the full range of experiences across diverse educational contexts. Additionally, reliance on self-reported data from reflective journals and interviews risks bias, as participants might skew responses or omit details. Future research should involve larger, more diverse teacher samples and incorporate quantitative methods to complement qualitative insights for a more comprehensive understanding.

## References

Acosta-Enriquez, B. G., Arbulú Ballesteros, M. A., Huamaní Jordan, O., López Roca, C., & Saavedra Tirado, K. (2024). Analysis of college students' attitudes toward the use of ChatGPT in their academic activities: effect of intent to use, verification of information and responsible use. *BMC Psychology, 12*, Article 255. https://doi.org/10.1186/s40359-024-01764-z

Al-Senaidi, S., Lin, L., & Poirot, J. (2009). Barriers to adopting technology for teaching and learning in Oman. *Computers & Education, 53*(3), 575–590. https://doi.org/10.1016/j.compedu.2009.03.015

Aydin, S. (2012). Teachers' perceptions about the use of computers in EFL teaching and learning: The case of Turkey. *Computer Assisted Language Learning, 26*(3), 214–233. https://doi.org/10.1080/09588221.2012.654495

Banzhaf, W. (2009). *Self-organizing systems*. Springer. https://doi.org/10.1007/978-0-387-30440-3_475

Cahyono, B. Y., Fauziah, H., Santoso, D. R., & Wulandari, I. (2024). Revisiting technological tools used in EFL speaking classes during the COVID-19 pandemic: What are the implications for the post-pandemic? *The JALT CALL Journal, 20*(2), 1–21. https://doi.org/10.29140/jaltcall.v20n2.1054

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education*. Routledge.

Connelly, F. M., & Clandinin, D. J. (2006). Narrative inquiry. In J. L. Green, G. Camilli, & P. B. Elmore (Eds.), *Handbook of complementary methods in education research* (pp. 477–487). Lawrence Erlbaum.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches*. Sage Publications.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative and mixed methods approaches.* 3rd edition. Sage.

Farhady, H., & Hedayati, H. (2009). Language assessment policy in Iran. *Annual Review of Applied Linguistics, 29*, 132–141. https://doi.org/10.1017/S0267190509090114

Fathali, S., Emadi, A., & Lotfi Jebeli, S. (2024). Digital literacy and EFL teachers' anxiety with teaching online via a virtual classroom software. *The JALT CALL Journal, 20*(2), 1–21. https://doi.org/10.29140/jaltcall.v20n2.1154

Gass, S. M. & Mackey, A. (2000). *Stimulated recall methodology in second language acquisition.* Erlbaum.

Gooran, M., Soleimani, H., Alavi, M., & Jafarigohar, M. (2023). EFL teachers' immunity: A case of online language teaching. *Journal of Multilingual and Multicultural Development, 44*(10), 908–927. https://doi.org/10.1080/01434632.2022.2044341

Greenier, V., & Moodie, I. (2021). Photo-narrative frames: Using visuals with narrative research in applied linguistics. System, *102,* Article 102597. https://doi.org/10.1016/j.system.2021.102597

Haghighi, F. M., & Norton, B. (2017). The role of English language institutes in Iran. *TESOL Quarterly, 51*(2), 428–438. https://doi.org/10.1002/tesq.338

Haji Jalili, M., Sepehri, M., & Shafiee, S. (2023). Teacher immunity in English language institutes and public schools: EFL teachers' perception in focus. *International Journal of Foreign Language Teaching and Research, 12*(44), 81–95. https://doi.org/10.30495/jfl.2023.699909

Hedayati, H. F., & Marandi, S. S. (2014). Iranian EFL teachers' perceptions of the difficulties of implementing CALL. *ReCALL, 26*(3), 298–314. https://doi.org/10.1017/S0958344014000172

Hiver, P. (2014). Once 15 burned, twice shy: The dynamic development of system immunity in teachers. In Z. M. Dörnyei (Eds.), *Motivational dynamics in language learning* (pp. 214–237). Multilingual Matters.

Hiver, P. (2017). Tracing the signature dynamics of language teacher immunity: A retrodictive qualitative modeling study. *The Modern Language Journal, 101*(4), 669–690. https://doi.org/10.1111/modl.12433

Hiver, P., & Dörnyei, Z. (2017). Language teacher immunity: A double-edged sword. *Applied Linguistics, 38*(3), 405–423. https://doi.org/10.1093/applin/amv034

Isisag, K. U. (2012, November). The positive effects of integrating ICT in foreign language teaching. In *Proceedings of the 5th International Conference ICT for Language Learning* (pp. 1–4). Libreria Universitaria.

Jiang, A. L., Sun, K., & Qin, T. L. (2024). Unraveling the relationships among EFL teacher emotions, immunity, and teaching quality: A multilevel structural-equation modelling analysis. *System, 124*, Article 103356. https://doi.org/10.1016/j.system.2024.103356

Joo, Y. J., Lim, K. Y., & Kim, N. H. (2016). The effects of secondary teachers' technostress on the intention to use technology in South Korea. *Computers & Education, 95*, 114–122. https://doi.org/10.1016/j.compedu.2015.12.004

Kamali, J., Paknejad, A., & Poorghorban, A. (2024). Exploring the challenges and affordances of integrating ChatGPT into language classrooms from teachers' points of view: An ecological

perspective. *Journal of Applied Learning and Teaching, 7*(2), 168–180. https://doi.org/10.37074/jalt.2024.7.2.8

Kastner, J. A. (2020). Blended learning: Moving beyond the thread quality of blended learning and instructor experiences. *Journal of Educators Online, 17*(2), 1–18.

Khazaeenezhad, B., & Davoudinasab, M. (2022). The relationship between language teacher immunity and personality type of Iranian EFL teachers. *Research in English Language Pedagogy, 10*(3), 490–516. https://doi.org/10.30486/relp.2022.1951540.1358

Li, S. (2022). Chinese English as a foreign language teachers' immunity and mindfulness as predictors of their work engagement. *Frontiers in Psychology*, *3*, 874356. https://doi.org/10.3389/fpsyg.2022.874356

Merriam, S. (2009). *Qualitative research: A guide to design and implementation*. John Wiley & Sons Inc.

Moser, K. M., & Wei, T. (2023). Professional development in collaborative online spaces: Supporting rural language teachers in a post-pandemic era. *The New Educator, 19*(1), 1–32. https://doi.org/10.1080/1547688X.2023.2174279

Özgür, H. (2020). Relationships between teachers' technostress, technological pedagogical content knowledge (TPACK), school support and demographic variables: A structural equation modeling. *Computers in Human Behavior*, *112* Article 106468. https://doi.org/10.1016/j.chb.2020.106468

Pourbahram, R., & Sadeghi, K. (2020). English as a foreign language teachers' immunity and motivation: Public schools vs. private institutes. *Teaching English Language, 14*(2), 269–299. https://doi.org/10.22132/tel.2020.125905

Rahimi, A., & Tafazoli, D. (2022). The role of university teachers' 21st-century digital competence in their attitudes toward ICT integration in higher education: Extending the theory of planned behavior. *The JALT CALL Journal, 18*(2), 238–263. https://doi.org/10.29140/jaltcall.v18n2.632

Rahmati, T., Sadeghi, K., & Ghaderi, F. (2019). English as a foreign language teacher immunity: An integrated reflective practice. *Iranian Journal of Language Teaching Research, 7*(3), 91–107. https://doi.org/10.30466/ijltr.2019.120738

Raygan, A., & Moradkhani, S. (2022). Factors influencing technology integration in an EFL context: Investigating EFL teachers' attitudes, TPACK level, and educational climate. *Computer Assisted Language Learning, 35*(8), 1789–1810. https://doi.org/10.1080/09588221.2020.1839106

Sabiri, K. A. (2020). ICT in EFL teaching and learning: A systematic literature review. *Contemporary Educational Technology, 11*(2), 177–195. https://doi.org/10.30935/cet.665350

Satvati, N., Kamali, J., Safian Boldaji, F., Khodadadi, M., & Akhondi, S. (2025). AI integration into language education and teacher identity: An ecological perspective. *Language Teaching Research Quarterly, 47*, 1–19. https://doi.org/10.32038/ltrq.2025.47.01

Taghizadeh, M., & Ejtehadi, A. (2021). Investigating pre-service EFL teachers' and teacher educators' experience and attitudes towards online interaction tools. *Computer Assisted Language Learning, 36*(8), 1633–1667. https://doi.org/10.1080/09588221.2021.2011322

Tseng, J. J., Chai, C. S., Tan, L., & Park, M. (2020). A critical review of research on technological pedagogical and content knowledge (TPACK) in language teaching. *Computer Assisted Language Learning, 35*(4), 948–971. https://doi.org/10.1080/09588221.2020.1868531

Wallace, J., Scanlon, D., & Calderón, A. (2023). Digital technology and teacher digital competency in physical education: a holistic view of teacher and student perspectives. *Curriculum Studies in Health and Physical Education, 14*(3), 271–287. http://dx.doi.org/10.1080/25742981.2022.2106881

Wang, Y., Derakhshan, A., & Azari Noughabi, M. (2022). The interplay of EFL teachers' immunity, work engagement, and psychological well-being: Evidence from four Asian countries.

*Journal of Multilingual and Multicultural Development, 45*(8), 1–17. http://dx.doi.org/10.1080/01434632.2022.2092625

Weiland, A. (2021). Teacher well-being: Voices in the field. *Teaching and Teacher Education, 99*, Article 103250. http://dx.doi.org/10.1016/j.tate.2020.103250

Wilson, M. L. (2023). The impact of technology integration courses on preservice teacher attitudes and beliefs: A meta-analysis of teacher education research from 2007–2017. *Journal of Research on Technology in Education, 55*(2), 252–280. http://dx.doi.org/10.1016/j.compedu.2020.103941

Yazan, B., Turnbull, J., Uzum, B., & Akayoglu, S. (2023). Neo-nationalist discourses and teacher identity tensions in a telecollaboration for teachers of minoritized language learners in Türkiye. *TESOL Quarterly, 57*(3), 775–803. https://doi.org/10.1002/tesq.3245

Yenkimaleki, M., & van Heuven, V. J. (2019). The relative contribution of computer assisted prosody training vs. instructor based prosody teaching in developing speaking skills by interpreter trainees: An experimental study. *Speech Communication, 107*, 48–57. https://doi.org/10.1016/j.specom.2019.01.006

Yuan, R., & Zhang, L. J. (2017). Exploring student teachers' motivation change in initial teacher education: A Chinese perspective. *Teaching and Teacher Education, 61*, 142–152. https://doi.org/10.1016/j.tate.2016.10.010

Zhang, L. J., & Rahimi, M. (2014). EFL learners' anxiety level and their beliefs about corrective feedback in oral communication classes. *System, 42*, 429–439. https://doi.org/10.1016/j.system.2014.01.012