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Language Teachers' Well-Being from the Complex Dynamic Systems Theory Perspective: A Retrodictive Qualitative Modeling Approach

Abstract

Language teachers experience many stressors and challenges due to the physical, emotional, and social demands of their work, negatively impacting their well-being and performance. Existing research on language teacher well-being has primarily examined the factors affecting it. However, limited research has focused on how language teachers' well-being changes over time and across long periods. To address this gap, this study investigates the well-being of two English language teachers in Turkey across the span of their careers from a Complex Dynamic Systems Theory (CDST) perspective, using a comparative case approach based on the PERMA framework, a model of psychological well-being and happiness including five components: positive emotions, engagement, relationships, meaning, and accomplishment. The data were collected through in-depth interviews with two English language teachers using retrodictive qualitative modeling (RQM) as the methodology. The data were analysed separately for each teacher and then compared. The analysis revealed several factors affecting the well-being of both teachers across their careers. The main theme that emerged was perseverance, which characterized the experience of both participants. Other common themes included professional development, responsibilities, social interaction, and student improvement. The study identified several factors shaping language teachers' well-being across their careers. The paper concludes with implications for promoting language teachers' well-being with suggestions for future research.

Keywords: language teachers' well-being, comparative case study, retrodictive qualitative modeling, PERMA

Recently, language teacher well-being has gained popularity due to the extensive research on the psychology of language teachers, particularly within the field

of positive psychology (e.g., MacIntyre, Gregersen, & Mercer, 2016; MacIntyre, Gregersen, & Mercer, 2019; Mercer & Kostoulas, 2018). This growing interest in teacher well-being can be traced back to a pivotal shift in applied linguistics: the introduction of Positive Psychology (PP), which emerged as a counterbalance to earlier research emphasizing negative emotional factors in language learning (MacIntyre & Gregersen, 2012). As highlighted by MacIntyre and Gregersen (2012), PP emphasizes the role of positive emotions (e.g., enjoyment) and the imaginative capacity of learners to broaden cognitive and motivational resources, thereby enhancing language acquisition. This shift not only creates new avenues for exploring well-being as a dynamic, facilitative force in language education but also expands its application to teacher psychology. As mentioned in several studies, this is mainly because teachers' well-being can have a strong effect on how much they enjoy their work and how well they can teach their students, which is crucial not only for them but also for learners since it influences learner outcomes and happiness (e.g., Bajorek, Gulliford, & Taskila, 2015; Briner & Dewberry, 2007; Day & Gu, 2010; Gregersen, Mercer, MacIntyre, Talbot, & Banga, 2020; Mercer, 2021; Talbot & Mercer, 2018). A combination of individual, professional, and environmental elements, particularly how we perceive our environment, contributes to our sense of well-being (see Mercer & Gregersen, 2020). According to Jin, Mercer, Babic, and Mairitsch (2021), well-being is not static; it constantly changes over time. However, the current literature on language teacher well-being focuses primarily on the factors that influence well-being (e.g., Babic, Mercer, Mairitsch, Gruber, & Hempkin, 2022; Derakhshan, Dewaele, & Noughabi, 2022; Greenier, Derakhshan, & Fathi, 2021; Proietti & Dewaele, 2021), with a few exceptions (i.e., Sak & Gurbuz, 2023; Sulis, Mercer, Mairitsch, Babic, & Shin, 2021) providing empirical findings on the short-term dynamic nature of well-being.

While researchers have focused on the factors affecting language teacher well-being, limited research has examined how teacher well-being changes over long periods (i.e., across a career). This lack of research makes it difficult to create effective support systems that meet the needs of teachers at different stages of their careers. One exception to the research on language teachers across their careers is the study by Hiver (2017), which examined the performance, motivation, and well-being of EFL teachers, focusing on how language teachers maintain balance and perform well in difficult and stressful jobs. Furthermore, Sulis, Mercer, Babic, and Mairitsch (2023) provide a comprehensive exploration of language teacher well-being across different career stages. However, they do not delve into the dynamic nature of well-being over time, leaving a gap in the understanding of the longitudinal trajectory of teacher well-being.

To address this gap, this study examines the well-being of two Turkish teachers of English from the beginning of their careers to the present, utilizing the Complex Dynamic Systems Theory (CDST) framework (Larsen-Freeman

& Cameron, 2008). Exploring the well-being of language teachers can offer insights into the specific challenges and successes language educators experience throughout their careers. This research aims to find the dynamic patterns (i.e., signature dynamics) that affect the teachers' well-being and understand the factors that cause changes at different points in their careers. Retrodictive Qualitative Modeling (hereafter RQM) (Dörnyei, 2014) is a means for tracing teachers' signature dynamics that influence their well-being, and the way the actions modify it. RQM reverses the typical approach by focusing on examining the past rather than predicting the future, with the aim of identifying factors that affect well-being. In this study, the RQM is used to understand teacher well-being to help create improved and long-lasting working environments for teachers. This can help teachers to stay longer in their jobs and, in turn, enhance student learning outcomes.

Literature Review

Complex Dynamic Systems Theory and Well-Being

Complex Dynamic Systems Theory (CDST), which is a relatively new approach to Second Language Acquisition (SLA) research, is derived from ecology, chaos theory, and complexity theory. It examines how humans learn languages in complex and non-linear ways (Dörnyei, 2014). CDST has been developed to understand complex, dynamic, adaptive, and feedback-sensitive systems (Herdina & Jessner, 2002). According to CDST, language learning occurs through the cooperation of many components working together in unpredictable ways (Larsen-Freeman, 1997). Based on this perspective, continuous changes lie at the center of language development and this change is formed through internal factors, such as motivation, and external factors, such as social and teaching environments (Papi & Hiver, 2020; van Geert, 2008). The concept of time scales is a significant part of CDST and it enables researchers to see the changes in time and understand how these changes affect a student's language development (De Bot, 2015). Systems adapt by responding to their environments and organizing themselves under changing conditions. While self-organization refers to making internal changes, co-adaptation refers to the response given to the feedback received from external sources such as teachers or peers (Hiver, 2015). Context includes cognitive, cultural, physical, and social elements and plays a significant role in CDST because language use and learning are closely related to these factors (King, 2016; Mercer, 2016). CDST

makes it possible to see language learning as a system that constantly changes and is shaped by each student's unique experiences and personal backgrounds.

Utilizing CDST to examine well-being allows researchers to observe that well-being evolves over time and is influenced by personal, social, and environmental factors. Similar to how language learning changes based on feedback and different conditions, teacher well-being can also be adapted and changed depending on the situation, and it is shaped by both internal and external factors over time (Mercer, 2021; Sulis et al., 2021). Regarding well-being research, Deci and Ryan (2002) point out two main views: hedonic and eudemonic. The hedonic viewpoint is about happiness, where well-being means feeling good and avoiding negative feelings (Kahneman, Diener, & Schwarz, 1999). This type of well-being is generally measured by Subjective Well-Being (SWB), which is how people judge their thoughts and feelings about their lives (Diener & Scollon, 2014), and it is linked to happiness (Deci & Ryan, 2002). The eudemonic perspective is about having a purpose and meaning in life (Gregersen et al., 2020; Mercer, 2021). In 2011, Martin Seligman brought together both views in the PERMA model. The PERMA model includes five elements: Positive Emotions, Engagement, Relationships, Meaning, and Accomplishment. Like CDST, this model also sees well-being not as the absence of negative experiences; instead, it is viewed as a process shaped by good experiences and conditions (Mercer, Oberdorfer, & Saleem, 2016). Instead of viewing well-being as the opposite of mental health problems, the model focuses on developing social and personal strengths (Mercer et al., 2016). This change focuses on understanding how we can nurture, encourage, and develop our social and personal qualities (Mercer et al., 2016).

Sulis et al. (2023) propose a different perspective on well-being. They believe well-being should be understood by looking at a person's social context, personal differences, and environment. This is similar to CDST, which sees well-being as shaped by external and internal factors that change depending on the person and their social context. Studies have shown that a teacher's personal and work life are interconnected and both sides affect their well-being (e.g., Johari, Yean Tan, & Tjik Zulkarnain, 2018; Mercer, 2021).

More recent conceptualizations of well-being embrace the complex dynamic system and ecological approach (Bronfenbrenner, 1993; Larsen-Freeman & Cameron, 2008; Mercer, 2021). Studies based on CDST see well-being as constantly changing and influenced by personal, social, and external factors (Sulis et al., 2021), thus it is a "broad, multifaceted construct" (TOV, 2018, p. 1). By looking at teacher well-being as a dynamic system, it can be understood as a result of ongoing interactions in different social, professional, and personal situations, which are essential for fully understanding language teacher well-being.

PERMA

The PERMA model created by Seligman (2011) describes five important elements that help increase well-being: Positive Emotions, Engagement, Relationships, Meaning, and Achievement. Each component plays a special role in building a satisfying and meaningful life.

1. **Positive Emotions:** Feelings like joy, hope, and gratitude are important for well-being. They help individuals see things more openly and grow intellectually and socially (Fredrickson, 2001; Mercer et al., 2016). These emotions both increase life satisfaction and improve our physical and mental health by supporting positive thinking and behavior (Lyubomirsky & Layous, 2013). In education, encouraging positive emotions in both students and teachers can increase motivation, creativity, and resilience (Helgesen, 2016; Schiffrin, 2014).
2. **Engagement:** Engagement means being fully involved in an activity, often reaching a flow state where time seems to fade away (Csikszentmihalyi, 1990). This deep focus brings joy and satisfaction. In teaching, engagement happens when teachers put their minds, emotions, and actions into activities, helping them feel connected to their work and more satisfied (Mercer et al., 2016). Engaged people can focus better, stay persistent, and feel more satisfied with life (Ruch, Harzer, Proyer, Park, & Peterson, 2010; Vella-Brodrick, Park, & Peterson, 2009).
3. **Relationships:** Positive relationships are crucial for well-being because they give social support and a feeling of belonging (Peterson, 2006; Seligman, 2012). In language teaching, strong relationships between teachers and students build respect and create a positive classroom environment (Mercer et al., 2016). Positive connections with colleagues and students also support teachers' well-being by building a helpful community (Gregersen et al., 2020).
4. **Meaning:** Meaning in life is the feeling of belonging to something bigger than oneself, which we often get by helping society or finding a purposeful role (Seligman, 2012; Butler & Kern, 2016). For teachers, meaning often comes from their commitment to teaching and their desire to make a lasting difference in students' lives. Research shows that people who feel their lives have meaning are healthier, stronger, and more satisfied with life (Brassai, Piko, & Steger, 2011; Steger & Shin, 2010).
5. **Accomplishment:** Accomplishment means setting personal goals and achieving them, which makes us feel skilled and like we are making progress (Seligman, 2012). For teachers, accomplishment can make them more confident and reduce the chance of burnout (Butler & Kern, 2016). Reaching goals, staying motivated, and learning new skills is important for feeling successful (Vasalampi, Salmela-Aro, & Nurmi, 2009).

Together, these five elements help people lead balanced lives by focusing not only on their happiness but also on connecting with and helping others (Diener & Seligman, 2002; Seligman, 2011).

The Present Study

Previous studies have explored the short-term dynamics of teacher well-being (e.g., Sak & Gurbuz, 2023; Sulis et al., 2021) or focused on specific career stages, such as late-career teachers (e.g., Babic, Mercer, Mairitsch, Gruber, & Hempkin, 2022). While some have examined factors influencing teacher well-being (e.g., Jin et al., 2021), none have investigated its evolution over an entire career. Understanding these long-term changes is essential for identifying the factors that affect professional satisfaction and sustainability throughout a teacher's career. This study aims to address this gap by using the PERMA model and a CDST framework to explore longitudinal changes in the well-being of two Turkish English teachers over their careers. To explore these longitudinal changes, this study adopts a Retrodictive Qualitative Modeling (RQM) approach, which allows for an in-depth examination of the signature dynamics shaping teacher well-being over time. Based on this objective, the author formulated the following research questions:

1. How do the processes and sequences of events in the teachers' careers influence their well-being?
2. What temporal causal mechanisms explain the changes in two teachers' well-being throughout their careers?

Method

Research Design

The author adopted Retrodictive Qualitative Modeling (Dörnyei, 2014) to answer the research questions through a comparative case study approach (Dul & Hak, 2008), enabling both a comparison between the cases and an analysis of each participant. Dörnyei (2007) pointed out that a qualitative research methodology can provide flexibility in answering research questions and accordingly offer unexpected answers; however, this is difficult to achieve in a quantitative study. Also, data gathered via qualitative research is valuable

in identifying individuals, settings, and discussions (Bogdan & Biklen, 1997). According to Mercer (2020), the significance of qualitative research in capturing the distinctive traits and personal subjectivities of well-being is increasingly recognized since well-being involves personal opinions and assessments of life. Retrodictive Qualitative Modeling facilitates the examination of how intricate patterns emerge within systems through self-organizing processes (Hiver & Al-Hoorie, 2019).

The first step of RQM is to identify the main outcome such as well-being in language teaching and then to trace back to the past (retrodict) in order to understand the factors or connections that led to this result (Hiver, 2017). This approach illustrates how different factors affect well-being over time. It emphasizes the importance of context, time, and multiple causes (Hiver & Al-Hoorie, 2019). Subsequently, typical cases that show this outcome, such as well-being, are chosen. Data are collected through interviews, questionnaires, and observations to understand behaviors based on the results and see how these results developed over time (Gu, 2023). Finally, the findings are analyzed to explore their broader impact on other systems and offer practical insights (Hiver & Al-Hoorie, 2016).

Using retrodictive qualitative modeling gave the author a look back at past events. Although it is not a long-term study (since data were collected from the two language teachers in two sessions), this method allowed the author to follow how the teachers' well-being changed over time in their careers. The time-related cues obtained during RQM interviews were analyzed through the Complex Dynamic Systems Theory (CDST) perspective to show how various factors influenced the participants' well-being over time.

Context and Participants

This study was carried out at a state university in Turkey, in the School of Foreign Languages, with two female English teachers, Bella and Emma (pseudonyms), who volunteered to take part. Both teachers are from Turkey, hold master's degrees in English studies, and are Ph.D. candidates, balancing their doctoral studies with full-time teaching jobs.

Bella, in her forties, has over 20 years of teaching experience at different levels of education. She currently teaches English to preparatory students and also coordinates a CEFR level in the department. Emma, in her thirties, has more than ten years of teaching experience and has worked at various state universities in Turkey. She also teaches English to preparatory students. The biodata of the participants are shown in Table 1.

Table 1*Biodata of Bella and Emma*

Attribute	Bella	Emma
Age	In her forties (exact age not specified)	In her thirties (exact age not specified)
Teaching experience	Over 20 years	More than 10 years
Educational background	Bachelor's and Master's degrees in ELT; Ph.D. candidate in ELT	Bachelor's and Master's degrees in English Linguistics; Ph.D. candidate in ELT
Current role	English teacher for preparatory students; CEFR level coordinator	English teacher for preparatory students. No additional roles specified

In this prep school setting, both teachers work with students from different backgrounds, helping them reach specific language skills needed for their future academic studies. Teaching English to preparatory students is challenging because the teachers must address different levels of student ability and meet language requirements for university-level education. Both Bella and Emma mainly use communicative and task-based teaching methods, which focus on improving students' practical language skills. They also benefit from the university's professional development programs, which help them manage the demands of their teaching and studies while maintaining their motivation and well-being in this busy and challenging work environment.

Procedure and Data Collection

RQM is a three-step process that starts with identifying the outcomes to be studied, which in this case is language teachers' well-being. The next step is to choose participants who represent this outcome. The author used Seligman's (2011) PERMA model to explore well-being, focusing on individuals' positive experiences. Accordingly, participants were selected based on the PERMA framework, that is, participants who experienced positive emotions, engaged in meaningful activities, built good relationships, found meaning in their work, and accomplished personal goals. To gather information, the author conducted initial individual and group interviews with four language teachers, focusing on their well-being. After this stage, the author selected two participants who met the criteria for the study, using a purposeful sampling method. According to Patton (2002), purposeful sampling means choosing cases with lots of useful information to study deeply and help understand important issues better instead of making general conclusions. The author followed a comparative case study

approach (Dul & Hak, 2008), by choosing participants who shared similar characteristics to understand the factors affecting language teachers' well-being.

In this study, RQM assisted the author in tracking how the well-being of the two teachers changed throughout their entire teaching careers. Data was collected through two semi-structured interviews with each participant online via Zoom. The interviews were audio-recorded and lasted around one hour each. The audio records were transcribed and immediately deleted after the completion of the transcription. The interviews consisted of open-ended questions guided by the PERMA model and the interview questions guided the participants to go into further detail about how they perceived their well-being as well as any other personal, environmental, or social factors they believed to have influenced their perspective throughout their careers. Consequently, this approach enabled the author to compare and contrast the well-being perceptions of the two participants from the beginning of their careers to the present.

Data Analysis

The data analysis comprises the last phase of RQM. As such, the transcribed data were entered into Atlas.ti software. The initial reading was done by the researcher to get accustomed to the data. The researcher kept memos. In the following stage, the initial coding was done with a Thematic Analysis (TA) approach (Braun & Clarke, 2006). The codes were processed and changed until a comprehensive set of themes was established. To enhance the reliability of the coding process, member checking was conducted with the participants. This enabled the researcher to share preliminary findings and gather feedback on the emerging themes. Next, an in-depth analysis of the participants' trajectories was carried out (RQ1). Finally, the comparative analysis was conducted according to individual trajectory and identified themes (RQ2).

Ethics

Participants were informed about the purpose of the study and notified that their involvement was entirely voluntary and that they could withdraw at any time. All data obtained are kept confidential by the researcher and stored in a safe place with access limited to the researcher. Therefore, every effort has been made to protect the rights and values of each participant.

Results

The main themes that emerged from the analysis of the interview data form the basis of the results. Each subsequent subsection begins with the examination of the participants' career trajectories, with a focus on the signature dynamics identified in the study. This is followed by a comparative analysis of the participants' career trajectories, highlighting the factors that contributed to their well-being throughout their careers. According to Mills, Durepos, and Wiebe (2010), comparative case studies aim to find differences, similarities, or patterns among cases, and at the same time, the cases must be similar enough to make comparisons possible.

Bella's Case

Bella began her teaching career in a challenging environment, at a public school that was located in a disadvantageous area with limited access to basic needs such as internet and water. This environment had a negative impact on her view of her profession and her well-being. Facing this hardship, Bella initially struggled with her sense of purpose. She made every effort to overcome those challenges and improve herself. She noted: "Well, as a young teacher I felt that I could fight against the difficulties and make a difference. I tried hard to cope with the difficulties and wanted to improve myself in my field." When asked how overcoming such difficulties made her feel, she mentioned that she felt happy and powerful, which impacted her well-being positively. In addition, she mentioned that she did not build good relationships with her students in the first year of her career and that this was also an issue for her well-being. She said: "As I mentioned before, my relationships were not good in my first year with my students." These challenges made Bella think about leaving her job; however, she decided to overcome them by making an extra effort, which made her stay in the profession. This sequence of events illustrates how early career processes, such as struggles with resources and relationships, shaped her initial well-being trajectory (RQ 1).

She was later transferred to a school closer to the city center where she could develop relationships with her students to promote her well-being. Bella's signature dynamic was her ability to compensate and adapt to challenges, her readiness to work hard, and her ability to build supportive relationships. It was adaptation to changing work environments that made her successful. She changed the way she taught, suited the new school, and developed positive relationships with her students. She was able to adapt and deal with problems in different ways because she was flexible and kept trying. She could deal

with challenges because she thought and did things differently. This routine kept her feeling good even when things became difficult. Her habits helped her stay strong and maintain her job in difficult times. A signature dynamic is a consistent behavior type, which emphasizes how one reacts to various situations. This consistent behavior helps in forming positive mindsets or habits. Bella's perseverance made her feel fulfilled overall. This was a significant moment in her career because it showed her how to deal with challenging situations. She could adapt to new places and her determination helped her grow in difficult times. She worked in different state schools and always found the power to overcome problems. She has insisted on this throughout her career and has always managed to deal with difficulties with determination. Therefore, perseverance was an important part of her well-being. This phase highlights a temporal causal mechanism (perseverance) central to (RQ 2), explaining how her evolving strategies sustained her well-being amid career transitions.

As her career went on, Bella worked hard to grow and improve in her job. After finishing her undergraduate studies, she earned a master's degree in English. She then started working at a state university. Soon after, in addition to teaching, she began working in the testing unit, seeing it as a chance to improve. About this, Bella said: "[...] I have learned a lot of things about assessment which made me feel improved." This highlights how the testing experience contributed to her sense of professional fulfillment and well-being. The dedication of Bella to professional development served as a signature dynamic, contributing to her well-being positively. However, her university responsibilities soon became overwhelming, which negatively affected her well-being. While working in the testing unit at her institution, she expressed feelings of being overworked. For instance, Bella said: "It was a trying duty and took most of my time and of course affected my teaching. I could have limited time for the organization of my classes." For someone who places great importance on her personal development and profession, the extra responsibilities negatively impacted her well-being and left her feeling inadequate. Bella stated during the member check that she learned a lot during her tenure as a member of the testing unit; however, she also felt exhausted and knew she needed to leave, realizing that well-being sometimes requires knowing when to step away from a stressful environment. She had both positive and negative experiences there and her well-being went through ups and downs during this period and after she left. She explained how her heavy workload negatively impacted her overall well-being. After leaving the testing unit, she felt the need to focus on her professional development and soon she was accepted to a Ph.D. program. As professional growth emerged as a signature dynamic for Bella, focusing on her studies contributed positively to her well-being throughout her career. These career sequences illustrate how professional development processes both enhance and challenge her well-being over time (RQ 1). Furthermore, the interaction

of commitment to professional development and workload shows the causal mechanisms that lead to fluctuations in her well-being (RQ 2).

Over the years in her teaching career, Bella found that building good relationships with her students was very important for her well-being. Regarding this matter, Bella said: “I had a great relationship with my students. I was happy where I lived.” Bella also reports that her approach to building relationships with students has changed throughout her career: “[...] my view of my profession and my students has changed a lot. [...] I can say that if you have a balanced and good relationship with the students you are one step ahead.”

In her member check speech, she also stated that building strong relationships enhances the quality of the learning and teaching process, which contributes to her well-being (RQ 2). This emerged as a signature dynamic for Bella. Seeing her students improve and having a part in that development positively improved her well-being and made her happy. Regarding this, Bella said: “I saw what a teacher means for small kids, how a teacher can affect and change them. I was amazed with this relationship.” She added: “As a teacher, the most important satisfaction source for me is seeing my students’ progress in language learning.” Seeing her students’ progress made her feel fulfilled and strengthened her commitment to teaching, as it allowed her to see the difference she was making. These feelings are positively linked to Bella’s well-being. This evolution in relational dynamics shows how relationship-building processes became a sustained source of well-being (RQ 1).

In retrospect, Bella’s career path shows her signature dynamic of adaptive perseverance, professional development, and strong relationships with students. Whether dealing with limited resources, work pressures, or the challenge of building strong relationships with students, she always found ways to overcome problems and improve her well-being. Her commitment to growth, along with the support she built with her students, helped her manage the challenges of her career with strength and happiness.

Emma’s Case

Emma, on the other hand, began her career as an EFL instructor at a university. Although she initially had some doubts about her teaching qualifications because she graduated in English Linguistics rather than English Language Teaching (ELT), she stated that she was very motivated and happy with her work. Emma worked very hard to cope with her initial doubts and put in lots of effort to feel competent and prepared. She was happy even though she earned little money in her first job. Regarding these, she said: “I enjoyed teaching there, but at the same time went on feeling nervous, and studying a lot just to make sure that I was qualified enough.” Emma’s dedication to

self-improvement and her determination to become successful despite low pay motivated her. Although she did not receive a formal ELT education, her perseverance played a significant role in her well-being and motivation to keep going. She shared that this period helped her to feel mentally prepared and confident in her abilities. As she stated, this made her: “[...] work twice hard [...]” Emma’s perseverance acted as a signature dynamic, a consistent motivational force that sustained her well-being throughout her career and was a key part of her success (RQ 2). This early phase demonstrated how her initial career processes, such as overcoming doubts through perseverance, shaped her well-being trajectory (RQ 1).

She worked at different state universities and always put in a lot of effort to prepare for her classes. This dedication helped her grow professionally and also made her feel proud and happy, demonstrating how early career processes influenced her well-being (RQ 1). She had to work hard to compensate for her lack of formal training, a challenge that was frequently mentioned throughout the interviews. She was always dedicated to her students, even when things were difficult. When asked about a class that did not work, she said: “I don’t remember any of my lessons that didn’t work at all because I got prepared well before my lessons.” Moreover, she says: “[...] no room for error [...]” This showed how hard she worked to avoid making mistakes in her lessons, which made her feel competent. Thus, her hard work and sense of adequacy contributed to her well-being. As she continued to work harder, she developed professionally, which further contributed to her overall well-being. In this context, she also noted: “I enjoyed helping my students to achieve their goals while improving myself as a novice teacher.”

As Emma’s career progressed, she found joy in her professional improvement. After completing her undergraduate studies, she earned a master’s degree in English. Even when she began working in the demanding testing unit at her institution, she viewed it as an opportunity to advance in the profession. Reflecting on her role in the testing unit, Emma stated: “I always saw it as a way of improving myself (via training, workshops, etc.)” Emma’s commitment to continuous learning contributed to her well-being, demonstrating how career progression and job challenges influenced her well-being over time (RQ 1). As she became more experienced and skilled, the quality of her teaching improved, enabling her to create a positive classroom atmosphere where strong relationships developed.

During the member check, when asked how professional growth made her feel, she linked it to a positive impact on her well-being. While her perspective on her profession and the relationships she built with her students contributed to her professional development, finding effective ways to communicate with students became an important part of her career. She added: “Evaluating my professional experiences across my career, my teaching, my view of my

profession and my students has changed a lot.” Even though working as a testing member contributed to Emma’s professional growth, soon it started to become an overwhelming duty, which negatively affected her well-being (RQ2). While working in the testing unit at her institution, she expressed feelings of being overwhelmed. Emma noted: “[...] I felt exhausted because of taking work home all the time.” This sequence of events shows how the demands of the testing unit influenced her well-being (RQ 1). Although she learned a great deal during her time as a member of the testing unit, the workload ultimately led to her decision to leave the unit and focus on her studies. She reports: “I felt the need to focus on my academic development starting with a PhD.” By concentrating on her academic growth, Emma created a positive cycle. This signature dynamic not only reduced her stress but also encouraged her to engage more deeply in her studies. Her drive to improve in her profession directly contributed to her well-being (RQ 2) and continues to do so, as she is currently a Ph.D. student. This may be seen as a step taken from an exhausting situation to a path that will make her happy.

Throughout her career, Emma’s well-being was also affected by the positive relationships she had at school. In particular, her learners played an important role in her well-being. She noted that collaborative, sincere relationships contributed to her happiness and created a productive learning environment (RQ 2). Regarding this matter, Emma stated: “The classrooms where my students and I could work as a team and establish a sincere relationship, always contributed to all of us.” However, later in her career, she states: “I also realized that sometimes it is possible that I cannot create a relationship at that level with some of my students.” As Emma gained more experience, she realized that it was not always possible to connect deeply with every student. In the beginning, she felt disappointed if she could not form strong bonds with them. Over time, she accepted the complexity of interrelationships, recognizing that each student is different, and she learned to adjust her approach to fit their needs. She adds: “At the beginning of my teaching journey, I used to beat myself up if it didn’t happen. However, now I still do what I can, but accept the fact that it is an “interrelationship” because now I’m more aware that each of my students is unique, so are their preferences.” Emma’s experiences show how complex and dynamic the classroom can be. This complexity affected her attitude toward her relationships with her students. Initially, she criticized herself; however, now she acknowledges the complex characteristics of language education. In this way, she can preserve her well-being by not accusing herself of being a bad teacher. In this way, Emma’s evolving approach to relationships showed how career processes influenced her well-being over time (RQ 1).

Over the years, Emma acknowledged that seeing her students improve and having a part in that development positively improved her well-being and made her happy. Regarding this, Emma expressed her enjoyment and stated:

“I enjoyed helping my students to achieve their goals [...]” Her well-being improved even more when she saw her students making progress, which made her feel more purposeful and committed to teaching. Emma said: “I love it when I see my students’ improvement as it is nice to see that I can touch their lives.” The performance of Emma’s students was also influenced by the relationship she cultivated with them.

A review of Emma’s career trajectory, her characteristic perseverance, dedication to career development, and building strong relationships with students are apparent. Even though she had doubts about her teaching qualifications and faced a heavy workload during her time at the testing unit, Emma kept focusing on improving her teaching skills and helping her learners. Her perseverance gave her a clear sense of purpose and well-being that continued for a long time (RQ 2). Moreover, her will to keep learning combined with her ability to develop supportive relationships in the classroom has enhanced progress in her career.

A Comparative Analysis of Bella and Emma’s Teaching Trajectories

Both Bella and Emma are two inspiring educators who are passionate about their work. Their dedication has helped them overcome many challenges. Bella began her career at a state school situated in a disadvantageous area where resources were limited and had many students with difficult backgrounds. Even though Bella faced many difficulties, she was determined to make a difference. Later, she was assigned to a new school where her determination to create a supportive learning environment helped her learners make good progress. Emma also began her career facing challenges. Even though she had a bachelor’s degree in English Linguistics, initially she had not received a formal education in teaching English as a foreign language. She had a low income at the beginning of her career; however, she was happy and worked hard to improve her teaching skills. Her efforts led her to pursue a Master’s degree in English Language Education, which advanced her career. Both teachers were motivated to keep improving, which is why they joined workshops, read a lot, and took courses to improve their skills. Also, they focused on building strong relationships with their colleagues. They derived satisfaction from students’ progress and the friendships they had made with other teachers. Bella and Emma’s stories show the perseverance and dedication teachers put into their work emphasizing how important perseverance is to overcome challenges and find satisfaction in their careers. Factors linked to Bella and Emma’s well-being are shown in Table 2.

Table 2*Comparison of Factors Affecting Bella and Emma's Well-Being*

Factor	Bella's Case	Emma's Case
Initial challenges	Negative impact: Disadvantaged school environment, limited resources, poor student relationships. Positive adaptation: Perseverance, adaptability, and effort to improve.	Negative impact: Doubts about qualifications (non-ELT background). Positive adaptation: Overcompensation through hard work and self-study.
Professional development	Positive: Pursued master's, PhD, and testing unit roles for growth. Negative: Overwhelmed by testing unit workload.	Positive: Master's, PhD, and testing unit roles for advancement. Negative: Testing unit exhaustion led to stress.
Responsibilities	Negative: Testing unit duties reduced class preparation time, causing inadequacy. Adaptation: Left to focus on PhD.	Negative: Testing unit demands led to burnout. Adaptation: Prioritized PhD to reduce stress.
Social relationships	Negative: Struggled early with student relationship. Positive: Evolved into a key well-being factor via balanced relationships.	Positive: Collaborative relationships enhanced well-being. Adaptation: Accepted complexity of student dynamics over time.
Perseverance	Signature dynamic: Flexibility in teaching style, perseverance in changing environments.	Signature dynamic: Perseverance through self-doubt and workload pressures.

The causal mechanisms (RQ2) influencing the two participants' well-being are shown in Figure 1.

Discussion

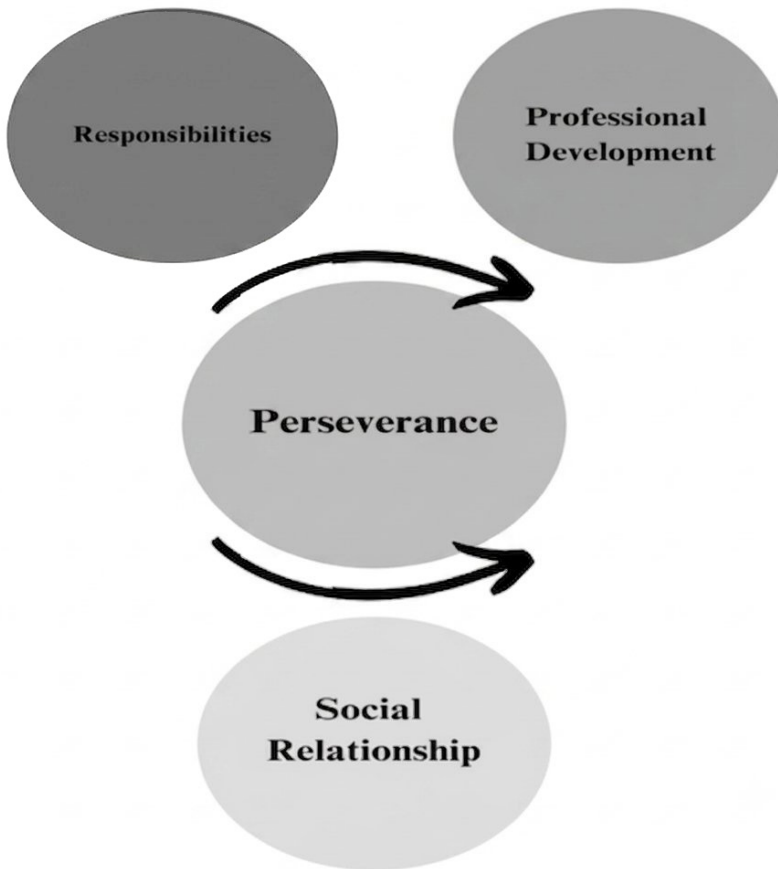
Complex Dynamic Systems Theory (CDST) conceptualizes language teacher well-being as a dynamic state that evolves over time rather than remaining fixed. Well-being is influenced by various factors such as personal, professional, and environmental. According to CDST, it is determined by the way these factors interact and adapt to changing situations (Sulis et al., 2021). Language teachers' well-being is multifaceted and fluid (Sak & Gurbuz, 2023; Sulis et al., 2021), dependent on the context (Mercer, 2020), and the interplay of numerous factors.

Various factors affecting language teachers' well-being have been identified by previous research and significant insights have been provided (e.g., Derakhshan et al., 2022; Ergün & Dewaele, 2021; Greenier et al., 2021). This study offers new insights about how language teachers' well-being changes over time and is

consistent with previous research. In this study, the well-being of two Turkish teachers of English was examined to explore the causal mechanisms that influence their well-being and signature dynamics that shape their behavior by analyzing their career trajectories.

Figure 1

The Model of Factors Contributing to Bella and Emma's Well-Being



In this study, the usual, stable behaviors that reflect each teacher's well-being are referred to as "signature dynamics," while the factors causing changes in their well-being over time are referred to as causal mechanisms. The study found that perseverance plays a significant role in shaping teachers' well-being as a key signature dynamic. Both teachers discussed overcoming career challenges without thinking about resignation, which demonstrates their

perseverance during challenging times. This shows the role of perseverance in maintaining their well-being.

According to Hiver (2018), many variables at play may facilitate or prevent instructors from adjusting and recovering when faced with adverse situations, including protective variables that may be connected to one's ability to self-regulate, supporting connections, and environmental features. The results so demonstrate that these professionals gain access to a variety of options to help them overcome challenges in both their personal and professional lives and maintain their careers (Jin et al., 2021).

Regarding the participants' perseverance, Bella showed determination after she had the opportunity to change her workplace. Even though her first job experience was negative, she chose to continue pursuing her job. Bella's perseverance became a signature dynamic of her career, helping her stay focused and stable despite challenges. These specific behaviors assist individuals in adapting to the challenges they encounter. Bella's continued perseverance helped her keep her well-being steady, even when her work environment changed. This consistent pattern in her behavior highlights her perseverance and determination. These qualities play an important role in enhancing her well-being, as they help her deal with difficult situations more effectively.

Emma, on the other hand, worked at a school where she did not earn the money she deserved. However, she was happy with her job because she had great relationships at school. Making little money might have been a negative aspect for her; however, instead of focusing on this challenging circumstance, she continued her career. For Emma, perseverance similarly emerges as a signature dynamic that helped her stay strong and motivated, even when she faced financial difficulties. She was able to keep focused on her job, despite low payment, which shows how her determination helped her maintain a positive attitude by focusing on good relationships and the purpose of her work.

CDST suggests that well-being does not follow a simple, linear path. Instead, it is influenced by different factors at different times, leading to times of growth and stability as well as times of difficulty. Both Bella and Emma experienced this change in their well-being: their well-being improved when they had strong relationships and opportunities to develop professionally; however, they also faced challenges when they had heavy workloads. The perseverant behavior of Bella and Emma helped them survive severe conditions. Their determination shows the "Meaning" component of PERMA, as both teachers find a sense of purpose and satisfaction in overcoming challenges at work.

Also, their ongoing commitment to their job matches the "Achievement" aspect, as they both work hard to improve despite facing difficulties. In line with the perseverance, the commitment participants showed to professional development is a source of increased well-being. This positive view of learning has the potential to be a truly useful psychological ability for teachers to

make use of and gain strength. According to Trejo and Roux (2014), since professional development experiences are the result of teachers' attentiveness, it is more likely that teachers feel fully dedicated to that improvement, and the changes that come from these experiences can last long.

Throughout their careers, both Emma and Bella continued to grow professionally, which served as a signature dynamic for both of them. They completed master's programs, participated in many trainings and workshops, and now they continue as PhD students. Being able to advance in the profession was positively linked with their well-being. Their dedication to professional development shows Engagement, as they take part in learning opportunities that help them grow. Additionally, the sense of achievement they feel fits with the Achievement component of PERMA, increasing their well-being as they reach new goals in education.

While growing professionally, not only did the teachers learn about their jobs, but they also improved the relationships they built with their students. Bella mentioned how she in time managed to find the right balance between herself and her students, which shows how the effect of professional development can be long-lasting. Professional development helped improve the well-being of both teachers. By focusing on growing their skills, Bella and Emma became more confident, which made them more committed to teaching. This shows the idea of reciprocal influences in CDST, where personal growth and well-being affect each other in a continuous cycle.

The analysis also showed that social relationships are significant in enhancing the well-being of the participants. This result is parallel with the literature as it suggests that social interactions are important for language teachers' well-being (e.g., Jin et al., 2021; Mairitsch et al., 2021; Talbot & Mercer, 2018). The relationships Bella and Emma had with their students, colleagues, and admins at their institutions contributed positively to their well-being. This also shows the importance of context in language teacher well-being (Mercer, 2021).

Both teachers expressed that they had great relationships across their careers, which was a source of satisfaction and happiness. Specifically for Emma the strong friendships she built worked as a signature dynamic that helped her feel good about her work. These regular, friendly interactions became very important for her happiness and enhanced her motivation. Her social connections provided a reliable source of joy and support in her professional life. Social relationships played a key role in the teachers' careers, acting as a central and important factor.

For instance, Emma often emphasized that her strong interpersonal relationships contributed to her well-being, especially during difficult times. This shows how social connections can support well-being when facing challenges. The concept of signature dynamics within CDST helps explain how such relationships foster stability and emotional strength, helping individuals maintain

balance in evolving work environments. Furthermore, as Bella and Emma gained professional experience, they developed more effective ways of interacting with others. In this way, the maturation of the teachers positively affected their teaching practice in general.

The strong social bonds Bella and Emma developed with students, colleagues, and administrators show the Positive Relationships component of the PERMA model, which is important for well-being. Additionally, their engagement with students enhanced a sense of Meaning in their work, as they perceived their roles as extending beyond teaching toward a greater purpose.

Regarding student improvement, the data indicated that teachers experienced a sense of accomplishment when observing their students' progress, which was positively linked with their well-being and also consistent with the literature (Shin et al., 2023). Both Emma and Bella derived satisfaction from observing their students' progress and achievements, which contributed positively to their well-being. From their early stages as novice teachers to their current positions as experienced teachers, they felt strong commitment to support their students' success.

At this point, the relationships they built throughout their careers played a significant role and emerged as a signature dynamic. They bonded with their students and put in every effort they could to help them succeed. It was gratifying to see their students succeed due to their dedication, which probably is the best a teacher can feel. Both teachers' satisfaction reflects the Achievement component of PERMA, which resulted in a sense of accomplishment. Additionally, the relationships they built with students enhance the Positive Relationships aspect, creating a supportive and fulfilling teaching environment.

One factor that negatively affected language teachers in the present study was their professional responsibilities. According to the literature, additional responsibilities are said to serve as a heavy workload for language teachers (e.g., Shin et al., 2023; Pourbahram & Sadeghi, 2022), which brings about stress (MacIntyre et al., 2019). This finding is consistent with the data obtained in the present study. For example, Bella and Emma faced an increased workload during their time in the testing unit at their institution. As a result, they had less time to prepare for their lessons and had to take work home, which negatively impacted their well-being.

While multiple sources contributed positively to Bella and Emma's well-being, an increased workload was a threat to them. Particularly, it affects the Positive Emotions component of PERMA by increasing stress and reducing teachers' energy for personal satisfaction. Additionally, it challenges the sense of Meaning in their work, as excessive responsibilities reduce the time for meaningful interactions and impactful teaching moments. Therefore, school administrators must ensure teachers are not overwhelmed by stress, as it can negatively affect their well-being.

Lastly, CDST shows that well-being is affected by the context and environment in which teachers work. Bella and Emma's story illustrate how perseverance, workload, professional development opportunities, and social relationships affected their well-being over time. These findings show that creating a supportive environment for teachers can help improve their well-being and benefit both teachers and students.

Conclusion and Implications

The study aimed to investigate how different factors affected the well-being of two Turkish teachers of English over time and to find out the signature dynamics that support or challenge their well-being. The study emphasized the important role of professional development, perseverance, responsibilities, social relationships, and student progress in teachers' well-being. These changes not only improved teachers' skills but also fostered a sense of accomplishment and engagement, thereby contributing to their well-being. The results showed that offering professional development opportunities is important, as well as that perseverance and experience enhance teachers' well-being. Teachers' hard work and commitment played a significant role in their well-being. Moreover, the relationships they formed created a supportive teaching environment in which teachers felt valued and connected. This, in turn, led to a school culture that supported long-term motivation and resilience among teachers. In addition, seeing their students' achievements added meaning to their work and increased their job satisfaction. However, additional responsibilities threatened their well-being. School authorities should ensure that teachers' responsibilities are manageable so they can balance their personal and work lives. This can help reduce burnout and improve long-term job satisfaction for teachers. By focusing on these factors, school leaders can create an environment in which language teachers can maintain well-being, which will help retain teachers and improve student results.

Limitations and Suggestions for Future Research

This study has several limitations. First, it did not focus on the moment-to-moment-changes in language teachers' well-being. These short-term changes could provide important insights into the factors that affect well-being, that is, daily interactions, classroom experiences, or support from school leaders.

Future research could use methods such as real-time data collection, including the idiodynamic method, to track these changes and examine how they affect teachers' long-term well-being. Investigating these changes could provide insights into fluctuations in teachers' well-being. Another limitation was the small sample size, as the study included only two teachers. While in-depth case studies offer useful knowledge, they may not apply to all teachers. Future research could include a larger and more diverse group of language teachers from different regions, school types, and levels of experience to make the findings more widely applicable. Additionally, a cross-cultural study examining teachers from different countries could constitute a valuable avenue for future research. Comparing teacher well-being across diverse cultural contexts would offer a more comprehensive understanding of the global factors influencing well-being and how they vary between cultures. Furthermore, while Retrodictive Qualitative Modeling (RQM) is an effective method for collecting retrospective data, it may be prone to biases in recollection, particularly over a long time. Teachers may have a distorted or selective memory of past events, which could influence the results. Future studies could consider combining RQM with other real-time methods, such as teacher journals or regular reflective practices, to provide a more balanced view of teachers' well-being over time.

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