A Scientometric Analysis of Language Teacher Emotions (2004-2022): Spotlight on the Impact of the COVID-19 Pandemic on LTE Research

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Abstract—Frontline language teachers have experienced anxiety, vulnerability, and emotional burnout as a result of the sudden transition to online teaching due to the COVID-19 pandemic. This study extracted Language Teacher Emotions (LTE) literature from the Scopus database during the period 2000-2022. During the first round of data extraction, 169 relevant documents written in English were identified. Furthermore, the researchers conducted a scientometric analysis using the literature analysis tool, CiteSpace (v.5.8.R3), and employed co-citation techniques involving visualization and text mining. Our results indicate the following: (1) The first LTE publication was released in 2004, followed by a growing number of publications in the first decade. Nevertheless, more studies were published during 2020-2022; (2) The five countries with the highest number of publications were the USA, China, Iran, the UK, and Turkey; (3) According to Author Co-citation Analysis (ACA), the majority of researchers had expertise in language education, teaching methods, educational assessment, teacher education, and applied psychology; (4) Based on the Document Co-citation Analysis (DCA), emotional labour, emotional burden, and vulnerability were the primary topics of interest; (5) Cluster analysis of keywords indicates that the LTE research trajectory was inevitably affected by the COVID-19 pandemic. As the first scientometric review of LTE research, this study calls for a greater understanding of the impact of online and blended teaching during the post-pandemic period. It will be of interest to inter-domain researchers and frontline teachers in terms of identifying influential scholars, publications, and research trends, as well as considering future research projects.

Index Terms—Language Teacher Emotions (LTE), COVID-19 pandemic, online teaching, scientometric analysis

I. INTRODUCTION

Hargreaves (1998) compared teachers' emotions to "the heart of teaching" (p. 835) because they have a significant effect on teachers' practice and the learning performance of their students (Leithwood & Beatty, 2007). Researchers typically approach the topic of teacher emotions from the perspectives of cognition and social construction (Benesch, 2020). In the cognitive framework, teacher emotion is defined as a psychological phenomenon and a private experience (Sutton & Wheatley, 2003). On the other hand, from a socially constructed perspective, Schutz et al. (2006) define teacher emotion as "socially constructed, personally enacted ways of being that emerge from conscious and/or unconscious judgments regarding perceived successes at attaining goals or maintaining standards or beliefs during transactions as part of social-historical contexts" (p. 344). Accordingly, teachers' emotions are influenced by culture, power, and ideology (Corbin & Strauss, 2014; Miller & Gkonou, 2018; Zembylas, 2005a).

It has become apparent that an increasing amount of research is being conducted on teachers' emotions, including both negative and positive emotions, in the online digital environment, which has expanded since the outbreak of COVID-19 in 2019. As a result of the pandemic, a large number of schools worldwide have discontinued offline face-to-face classes and have shifted to online classes (Zhao & Li, 2021). Hodges et al. (2020) explained that Emergency Remote Teaching (ERT) is used to describe the situation and to highlight that teachers are always the first to take responsibility when there is an emergency change in the delivery method. The physical and social conditions of teaching will elicit a variety of emotional responses from teachers, according to Nias (1996). Therefore, online teaching

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has altered both the physical structure and environment of traditional offline teaching, resulting in more emotional experiences among teachers. Language teachers have shown complex perceptions of online teaching in studies because they lack sufficient digital literacy, struggle with maintaining classroom discipline, or do not have enough time to prepare for classes. Zhao and Li (2021) stated that teachers' positive emotions play a regulatory role in the online teaching environment, whereas negative emotions are prevalent. Due to the growing demand for blended teaching in the post-pandemic era, existing research on the impact of online teaching on teachers' emotions is still in its infancy. Researchers should pay more attention to the impact of online teaching on teachers' emotions during and after the COVID-19 pandemic, as Lockee (2021) explicitly called for more research on this issue.

The need for more systematic, integrated, and in-depth analyses of language teachers' emotions is a pressing issue for researchers and front-line teachers alike. Furthermore, as a result of the limitations between disciplines, most researchers tend to present a singular view of the status quo. There is a great deal of difficulty in gaining a comprehensive understanding of Language Teacher Emotions (LTE) from an inter-disciplinary perspective. The primary objective of this study is to address the existing gap in the literature on LTE research between the years 2000 to 2022 by utilizing advanced CiteSpace information visualization techniques. This approach will help us explore the core literature on LTE research and provide researchers with a comprehensive overview of the changes and developments in this area. By examining and analyzing the research papers and publications related to LTE, we aim to fill this void and contribute to the existing knowledge base. In this paper, we have identified five specific research questions that we will address. These questions will help us gain a deeper understanding of the current state of research on LTE and identify potential avenues for future research. Our questions are as follows:

- 1. What are the emerging trends in terms of the number of publications in the field of research on language teachers' emotions?
- 2. Based on the total number of publications, from which countries or regions do researchers focus more on related fields?
- 3. According to the Author Co-citations Analysis (ACA), which researchers are leading research in the relevant field?
- 4. From the Document Co-citation Analysis (DCA), what research themes can be derived that have drawn the attention of relevant researchers?
- 5. In the timeline of cluster analysis of keywords, what are the trends in topics of related research?

II. METHODOLOGY

The primary research tool in this scientometric study was CiteSpace (v.5.8.R3), a highly influential citation visualization software developed by Chaomei Chen that is based on scientometric analyses and data visualization principles. Using the citation networks, this study generated the history and evolution of research in the field of Language Teacher Emotions to reflect the most recent topics of concern and their development trends (Rey-Mart íet al., 2016). Although there are many other software packages and general-purpose tools aimed at scientometric visualization, such as HistCite, few are as specifically designed as CiteSpace for reviewing evolving and complex domain-generating systems (Hou et al., 2018).

In this study, data were collected from the Scopus database, which is the largest abstracting and indexing database in the world. Scopus covers 27 subject areas with a broader search scope as well as a more balanced distribution of data sources based on the country of publication, enabling a more comprehensive international distribution. Additionally, the citation index is more diverse because it takes into account data from all databases within the system. This study examines trends in research on Language Teacher Emotions (LTE), which is a relatively small body of literature involving interdisciplinary research in education, psychology, applied linguistics, and sociology. We also chose to extract relevant studies from the Scopus database to avoid the database of cited publications downloaded from Web of Science (WoS) that only contains the names of the principal (first) author, resulting in different results when analyzing co-citations.

As part of the inclusion criteria, the time period was defined as from January 1st, 2000 to October 1st, 2022, with the range set at 1 year. In the search scope, "Title, Abstract, Keywords" were specified, and "search documents" was determined as "teach* emotion*" AND "language", and the language of the documents was restricted to "English". There were 185 articles that were preliminarily obtained for this study. The following 13 articles were excluded from the list due to irrelevant studies, such as conference reviews and book reviews, and were manually checked and filtered to obtain 169 articles that met the criteria for being relevant and valid. Due to the lack of publications on Language Teacher Emotions (LTE) between January 2000 and December 2003, this study analyses only the relevant studies published between January 1st, 2004 and October 1st, 2022.

III. RESULTS

As a response to Research Question 1, we organized relevant literature by the year of publication to gain a macro-level understanding of research related to Language Teacher Emotions (LTE). Figure 1 displays the number of research papers published on LTE in the Scopus database from 2004 to 2022 in a histogram. Until 2017, the number of

Emotions (LTE).

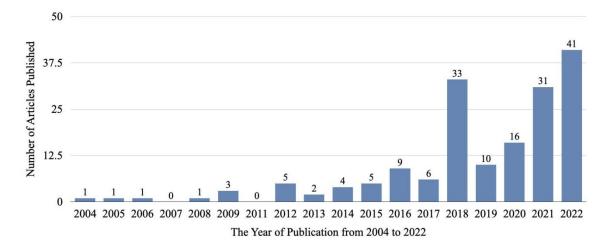


Figure 1. The Number of Articles Published Annually on the Topic of Language Teacher Emotions (2004-2022)

To address Research Question 2, we categorized the literature related to Language Teacher Emotions (LTE) by the researchers' or teams' country or region of origin. Each circle in Figure 2 represents a node, with the size of the circle reflecting the number of articles published in that country or region; the larger the circle, the greater the number of articles indicating recent explosive growth. The country with the most publications in LTE research is the United States (34 articles), followed by China (30 articles), Iran (25 articles), the United Kingdom (11 articles), and Turkey (7 articles). Numbers in brackets indicate the number of publications issued by researchers or teams in each country or region in recent years. American scholars first published papers on Scopus database in 2004, while Chinese scholars published their first papers in 2018, and they have shown explosive growth in their publications. It is worth noting that Iranian scholars' first publication was in 2009, but there has been an explosion of interest in LTE in recent years due to the COVID-19 pandemic.

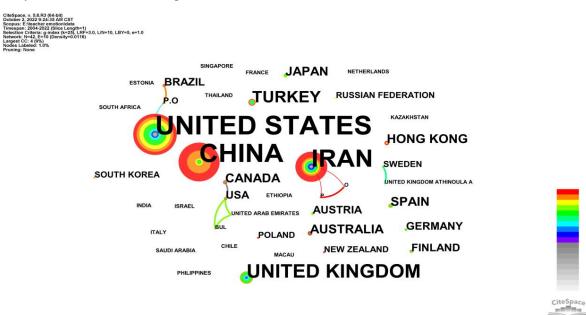


Figure 2. The Country or Region in Which the Researchers or Teams Were Based

As part of our effort to answer Research Question 3, we adopted an Author Co-citation Analysis (ACA), which helps us identify leading researchers in this field. A co-citation relationship occurs when one or more papers cite two or more

authors. As a result of co-citation analysis, it is possible to identify influential authors and classify them into specific professional fields, with highly cited authors typically considered to be in the same field of expertise (White & Griffith, 1981). To analyze highly cited authors in this field, we adopted the g-index along with the Pathfinder network scaling method. The merged network was pruned to optimize the overall network mapping, resulting in the co-cited authors' network mapping that includes 439 network nodes and 1185 connected lines in Figure 3. It is important to note that each node is accompanied by an annual ring of varying sizes that indicate the node's citation history. There is a correlation between the frequency of citations and the size of the annual ring. In our co-citation analysis, we also highlight the main areas of research focus of the top five LTE researchers.

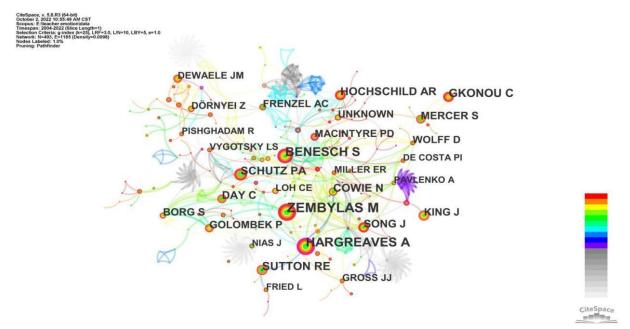


Figure 3. The Network Map of Author Co-citation Analysis (ACA)

Michalinos Zembylas, who has been co-cited 72 times, is from the Open University of Cyprus and leads interdisciplinary research in the fields of critical pedagogy, social psychology, comparative education, and ethnography. In the field of education, Zembylas focuses on teachers' emotional labour and emotional rules. He argues that teachers' emotions are shaped by culture, authority, and ideology, as seen through the lens of discursive frameworks. The vast discrepancy between teachers' professional status and their actual feelings often forces teachers to conceal their experiential emotions to express what is deemed to be the legitimate expected emotions in a given context (Zembylas, 2003). Normative-based beliefs and proper emotions of the teaching profession can cause a great deal of emotional labour and vulnerability for teachers. Zembylas has dealt with the main area of research related to teacher identity in social psychology, where he found that teachers' emotions play a crucial role in their identity and ability to act (Zembylas, 2005b).

Andy Hargreaves (co-cited 57 times) from Boston College focuses on the well-being of teachers, arguing that teacher emotions play an essential, even moral role in the development of teachers (Hargreaves, 1998). Hargreaves (2001) developed the concepts of sustainable leadership and the emotional practice of teaching, highlighting the emotional dimension of teaching as fundamental to sound pedagogical formation and the ability of teachers to understand their own experiences.

Sarah Benesch, from the City University of New York (co-cited 52 times), focuses on teachers' emotional labour in the classroom, arguing that teachers should manage the relationship between what they feel and what they should feel in a given situation in a way that is reasonable and appropriate. Research on educators' emotional labour in schools has been divided into two camps: structural perspectives and post-structural perspectives (Benesch, 2017). In the structural camp, emotional labour is divided into three dimensions or strategies: surface behaviour, deep behaviour, and expression of naturally felt emotions. In the post-structural view, it is believed that when teachers adopt a positive attitude under normal conditions, students will benefit from the teachers' active involvement, and teachers will benefit from their professional well-being and emotional well-being. Moreover, Benesch (2020) examined how positive psychology can mediate emotional labour in a positive way. According to this study, teachers enact the discourses of inevitability, unfairness, and injustice in their experiences of emotional labour.

Christina Gkonou (co-cited 34 times) is an expert in the field of language learners' anxiety and language teachers' emotions who has conducted research at the University of Essex. Instead of categorizing language teachers' emotions as either positive or negative, Gkonou (2021) proposed that scholars should focus on the impact of teachers' emotions from a "historical, cultural, contextual, and socio-political perspective" (p. 2). As a result, language teachers' emotions

are not just psychological phenomena and emotional states that individual language teachers experience, but they also reflect their reactions to other people as well as their environment.

Rosemary E. Sutton (co-cited 34 times) from Cleveland State University examines the relationship between teacher emotions and classroom effectiveness, as well as teacher training in emotion regulation strategies. She suggests that teachers utilize emotion regulation strategies to understand and manage complex emotional experiences while teaching. These strategies include prevention strategies (cause-based) and response strategies (response-based) (Sutton & Harper, 2009). The emotion regulation strategies are manifested in the following forms: contextual selection, situational change, attention deployment, cognitive change, and response regulation, which are proven to enhance classroom teaching effectiveness (Sutton & Harper, 2009). Teachers can build caring relationships with students by providing an ideal image of the teacher to the students, increasing student well-being, motivation, engagement, and improving classroom discipline (Sutton, 2010).

To examine Research Question 4, this study employed Document Co-citation Analysis (DCA). The co-citation relationship between two or more papers forms when one or more studies simultaneously cite two or more papers (Chen, 2004, 2006). DCA is a method used to increase knowledge integration and establish interdisciplinary coherence. It is capable of identifying relevant literature and scholarly communities that may be missed by standard literature search methods. Network maps resulting from DCA are useful in visualizing the connections and gaps between published research areas (Small, 1973). By counting the core literature at high frequencies in a field of study, it can be possible to better understand the direction and focus of academic research in that field. Figure 4 shows the map, which has 415 nodes in the network and 1044 connections among them, with the Largest Co-citation at 140. Each node corresponds to a piece of literature, showing the name of the author and the year of publication.

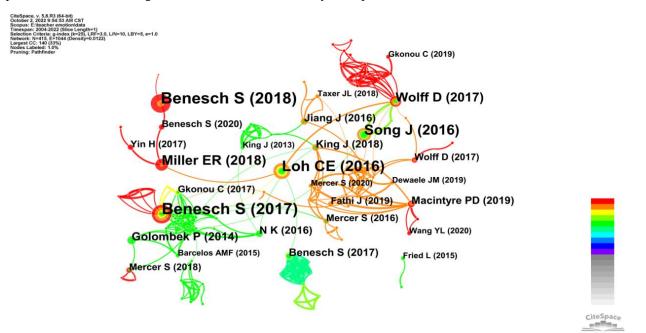


Figure 4. The Network Map of Document Co-Citation Analysis (DCA)

Sarah Benesch is the author of the two most cited publications in the field of LTE. The study by Benesch (2017) has been cited 14 times, and it examined the connection between the teaching of the English language in higher education and the activation of classroom emotions, as well as a detailed analysis of the implicit feeling rules teachers use and how they impact their emotions and decision-making. Benesch (2018), which has also been co-cited 14 times, explored how affective rules and emotional labour can be used as mediators and decision-making tools by language teachers. To determine if teachers' agency and decision-making were influenced by interviewing them about their responses to student plagiarism at an American university, data was collected. As revealed in interviews about addressing student text plagiarism, the article examines teachers' emotional labour and makes suggestions for the future of teacher education. As we can see, both publications emphasize the role played by teachers' emotional rules and emotional labour, and their impact, demonstrating Sarah Benesch's considerable influence in the field of language teachers' emotions.

It should be noted that there are three subsequent articles that have been heavily cited in this field: Loh and Liew (2016), Song (2016), as well as Wolff and Costa (2017). Loh and Liew (2016) (co-cited 12 times) described the emotional burdens, tensions, and challenges associated with teaching English. These emotions were largely explained by the value-laden content of the discipline, the burden of grading student papers, the pressure of high-stakes testing performance, and the requirement for culturally sensitive pedagogies. According to Song (2016) (co-cited 10 times), changing teaching contexts resulting from globalization place new demands on English teachers. In this study, the

researcher examined how teachers' orientations toward continuing professional development were influenced by their vulnerability, facilitating or hindering their teaching and self-transformation, as well as their emotional responses to demands on their identity and practice. A study by Wolff and Costa (2017), which has been cited eight times, examined the emotional needs of non-native English speaking teachers (NNESTs). It explored a non-native English teacher's experience of actively coping with emotional challenges, as well as how emotions affected her identity development, and called for a new teaching model in society to enable teachers to cultivate reflexivity to cope with emotional challenges. In spite of this, the number of citations in these five publications suggests that LTE is still an emerging field and still receives relatively little attention, which means that researchers and front-line teachers need to engage in more in-depth inquiry and reflection in this field.

A keyword analysis can be performed in order to address Research Question 5, where instances of two keywords appearing together are analyzed (Chen, 2017). The properties of the network and clusters were investigated using both temporal and structural metrics. For the purpose of visualizing the shape and form of the networks, we used two types of visualization methods: the timeline view (see Figure 5) and the cluster view (see Figure 6).

This timeline view consists of a number of vertical lines that represent time zones chronologically as they are arranged from left to right, as illustrated in Figure 5. In contrast to the horizontal arrangement of nodes that is confined to the time zones in which they are located, it allows for the nodes to have vertical links with nodes in another time zone (Chen, 2014). In this study, there are several keywords associated with the first stage of this research (2005-2009): "teacher emotion" (Kelchtermans, 2005; Pavlenko, 2005), "teacher identity" (Varghese et al., 2005; Zembylas, 2005), and "early childhood" (Kremenitzer & Miller, 2008). The second stage of the research (2009-2019) saw a boom in the research on the emotions of language teachers during this time period. A number of researchers took an interest in "emotional intelligence" (Yin et al., 2013), "career development" (Hiver, 2013), "anxiety" (Trigwell, 2012), "burnout" (Oberle & Schonert-Reichl, 2016), "emotional labour" (Keller et al., 2014), "novice teacher" (Beauchamp & Thomas, 2009), and "teacher education" (Shapiro, 2010). During the third stage (2019-2022), the keywords describing this period are COVID-19 (Jones & Kessler, 2020), "online education" (Ngo, 2021), "emotional scaffolding" (Back et al., 2020), and "work engagement" (Alger & Eyckmans, 2022). Due to the outbreak of COVID-19, there has been a significant increase in attention paid to the emotions of language teachers. As a result of the rapid shift in teaching activities to online, pedagogical changes have also been made during this period.

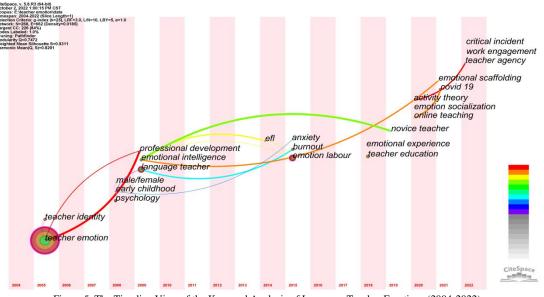


Figure 5. The Timeline View of the Keyword Analysis of Language Teacher Emotions (2004-2022)

As an alternative, the cluster view represents the spatial network in a landscape format that is color-coded and labelled according to an automated process (Chen, 2014). To better understand the development of LTE research, we chose to use the log-likelihood ratio algorithm (LLR) to extract labels for clusters automatically. This algorithm provides the best results in terms of the uniqueness and coverage of clusters (Dunning, 1994). The modularity Q score and the average silhouette score are structural metrics (Chen, 2014). The modularity Q is a measure of the extent to which a network can be divided into modules based on a value between 0 and 1. Thus, this profile has a Q value of 0.7472 > 0.3, indicating a significant distinction between the clusters. In addition, there is the Silhouette S value, which ranges from -1 to 1, where a value of 1 indicates that a cluster is distinct from the other clusters. In this study, S=0.9311>0.7, indicating that the clusters are credible and that the nodes within them are highly correlated.

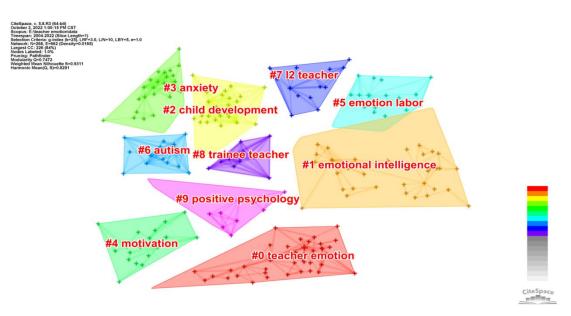


Figure 6. The Cluster View of the Keyword Analysis of Language Teacher Emotions (2004-2022)

To begin with, research on LTE has expanded to examine specific research areas in Cluster #7 (Silhouette = 0.897), which focuses on second language teachers, and Cluster #8 (Silhouette = 0.923), which focuses on novice language teachers. There have been increasing challenges faced by second language educators, including doubts about their language proficiency, self-identity construction, dealing with learners' emotional anxieties, college entrance examination pressure, cross-cultural teaching, and precarious conditions associated with online teaching (Borg, 2006; Cosgrove, 2002; Her & De Costa, 2022; Loh & Liew, 2016; MacIntyre et al., 2020; Mercer et al., 2016). Similarly, trainee teachers also experience emotional conflicts and identity ambivalence. Trainee teachers need support in adjusting to prevailing expectations, building and maintaining relationships with staff, learning procedures, and adapting to school priorities (Hayes, 2003). Otherwise, they may experience negative emotions due to being marginalized in the trainee school (Yuan & Lee, 2016).

It is also worth mentioning that Cluster #5 (Silhouette = 0.916), dubbed "emotional labour", and Cluster #3 (Silhouette = 0.849), dubbed "anxiety", take a closer look at the emotions that language teachers may encounter when interacting with students. Based on Hochschild's theory of emotional labour from 1983, the need for airline employees to perform emotional labour is to achieve their career goals and/or to succeed in the industry. Similarly, the concept of emotional labour is an attempt to manage and regulate a teacher's emotions, roles, and identities (Zembylas, 2002), especially when acknowledging one's professional status there is a considerable gap between trying to feel and actually feeling (p. 196). When teachers follow the emotional rules of their classroom environment, they must hide their actual feelings and consciously regulate them internally (Hochschild, 1983). Many of the negative emotions experienced by teachers have been found to manifest as anxiety, represented by Cluster #3 in the studies conducted. There are many negative emotions that may affect educators' health (Guglielmi & Tatrow, 1998; Hakanen et al., 2006), including frustration, fatigue, and anger. As a result of feeling anxious and fearful, teachers tend to avoid potentially risky situations, perhaps shutting down communication and withdrawing from others (Lasky, 2005). The COVID-19 pandemic has led to the implementation of online education in schools all around the world, which has once again increased the attention of researchers on the anxiety of teachers. Due to the fact that teachers are required to adapt to new teaching methods that are different from the methods they are used to with offline teaching, this will lead to higher levels of loneliness, isolation, and anxiety (Fraschini & Tao, 2021; Jiang & Koo, 2020).

For the purpose of reducing the impact of negative emotions on language teachers, researchers have focused their attention on Emotional Intelligence (indicated as Cluster #1, Silhouette = 0.937) and Positive Psychology (indicated as Cluster #9, Silhouette = 0.949). In order to be a successful language teacher, one must recognize potential anxiety and manage it appropriately and effectively (Gkonou, 2017). There is an ability to manage one's emotions and relationships with others, which is defined as 'emotional intelligence' (Goleman, 1995), and it has been found to be vital to the improvement of teaching satisfaction (Bar-On, 2010; Yin et al., 2013). In recent years, positive emotions have been consistently emphasized in language teaching (Arnold, 1999; Arnold & Fonseca, 2007; Gregersen, 2013). As indicated in Cluster #9, positive psychology, the concept was first introduced by Seligman and Csikszentmihalyi (2000), and it is driving the shift in research focus from negative to positive emotions and their role in enhancing the educational outcomes of L2 teachers and students (Lake, 2013). Wang et al. (2021) provided a conceptualization of seven variables of positive psychology, which include academic engagement, emotional regulation, enjoyment, stamina, love pedagogy, resilience, and well-being, and explained how these factors can make a difference when it comes to learning and teaching a second language. There is a growing body of evidence suggesting that positive emotions can make both language teaching and language learning more enjoyable and meaningful, as well as help teachers and learners be more

resilient when faced with challenges during teaching and learning situations (Gregersen, 2013).

Moreover, the attention of Cluster #2 and Cluster #6 primarily concentrates on social-emotional aspects and the early development of young learners, including children with autism in their learning environments. Children's exposure to social relationships with teachers outside of their families is significant, and the emotions of teachers can impact their social-emotional outcomes. However, this study does not delve into these areas since they primarily focus on the learners rather than the teachers and have received relatively little research attention.

IV. CONCLUSION

This study presents a scientometric analysis of the international research on Language Teacher Emotions (LTE) through a deep data mining of 169 articles published in the Scopus core database between 2004 and 2022. The analysis revealed that over the last two decades, LTE research has predominantly focused on theoretical analysis, exploration of its application, and analysis of its effectiveness in practice. Moreover, the study identified the prominent authors and scholars who have significantly contributed to the field of LTE, including Michalinos Zembylas, Andy Hargreaves, Sarah Benesch, and others, whose research has enriched and developed contemporary educational psychology.

While this study provides valuable insights into the LTE research landscape, it has some limitations. Firstly, the analysis is restricted to the Scopus core database, and non-journal publications such as books or chapters in books were excluded. Therefore, the findings may be biased towards leading researchers and institutions in the field of LTE research. Future studies could consider a broader range of publications for a more comprehensive analysis. Secondly, the study used a holistic approach to co-citation analysis, which did not differentiate between sub-fields within the LTE research domain. Future analytical studies could provide more in-depth information regarding the status of LTE in specific sub-fields, such as teacher emotions and positive psychology.

Due to the outbreak of COVID-19 that has affected a large number of countries around the world, the education system and order have undergone a great deal of change. Online learning modes, in conjunction with information and communication technology, have become the mainstream means of teaching around the world in order to cope with its implications. As part of this large-scale, urgent transformation, we must recognize that teachers are facing more teaching and interaction challenges in the new teaching environment of online learning, resulting in more complex and multidimensional emotional experiences. Furthermore, with the increasing popularity of technology in language learning in the post-pandemic era, researchers should be aware of how changes in language teachers' emotional states are influenced by computer-assisted language learning, online, offline, and blended learning options. As a result of this process of change, teachers make sense of their emotions and look for alternatives that might help them transform these emotions in a positive way. Our final recommendation is that more researchers and frontline teachers conduct in-depth and longitudinal research into Language Teacher Emotions (LTE) in various contexts to provide valuable insights in this emerging area.

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