CALL TEACHER EDUCATION AND PROFESSIONAL DEVELOPMENT: A RETROSPECTIVE SYNTHESIS OF THE TWO DECADES OF *TEACHING ENGLISH WITH TECHNOLOGY*

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Abstract

Since 2001, *Teaching English with Technology* (TEwT) has published hundreds of research articles to improve the quality of applying technology in language education and research. This collection of articles has covered many aspects of Computer-Assisted Language Learning (CALL); however, due to the importance of CALL teacher education and professional development, a research synthesis of the two decades of TEwT's articles holds the potential to screen the field at large over that time period. By examining the published articles on CALL teacher education and professional development, data analysis revealed that most of them focused on 'teachers' perceptions, attitudes, and experiences,' 'CALL practicum,' 'teachers' knowledge, literacies, and skills' and 'CALL affordances and hindrances'. This study might help as an extant inventory of CALL research interests over the first 20 years of the Journal's existence.

Keywords: Retrospective synthesis; Computer-Assisted Language Learning (CALL); CALL teacher education (CALL TE); CALL professional development (CALL PD)

1. Introduction

The journal of *Teaching English with Technology (TEwT)* was established in 2001 as a forum for language teachers to share their ideas and experiences with other colleagues worldwide. The aim of that professional community was not only to publish theoretical and academic articles but also to share practical lesson plans and language teachers' practical needs. Jarosław Krajka, the founding editor-in-chief, was aware of the differences between the infrastructures and other influencing factors in the successful implication of Computer-Assisted Language Learning (CALL), but he believed that "what is common to us all is, on the one hand, the same objective – to teach the same language, English, and on the other hand the same teaching medium – the Internet and computers" (Krajka, 2001, p. 1). Thus, the Journal's first issue started with an

article, an internet lesson plan, a website review, and a software review, and this pattern has continued for two decades.

Two decades of sustainability in a specific area in education show us the significance and development of this guiding light in the fields of both English and teaching with technology. Twenty years is a suitable period to accomplish a big-picture perspective of a narrowed-down area (Stapleton & Shao, 2017). Therefore, in this research synthesis, I take this opportunity to reflect on the two decades of *TEwT* journal focusing on CALL teacher education and professional development (henceforth CALL TEPD).

The common types of research synthesis in CALL investigate a particular aspect of teaching, learning, technology, theory, or research in many journals: a qualitative research synthesis on task-based language teaching and CALL (Chong & Reinders, 2020), a meta-analysis on the learning effect of CALL in empirical studies (Sharifi et al., 2018), a meta-analysis of the impacts of 3D virtual worlds on language learning (Wang et al., 2020), a systematic and meta-analysis on mobile-assisted EFL/ESL vocabulary learning (Lin & Lin, 2019), an integrative review and synthesis on blended language learning (Hughes et al., 2019), a systematic review of empirical studies on computer-mediated collaborative writing (Li, 2018), a scoping review digital game-based technology on English language learning (Xu et al., 2020), a scientometric review of research trends in CALL (Lim & Aryadoust, 2021), a qualitative meta-analysis on the role of telecollaboration in language and intercultural learning (Çiftçi & Savaş, 2018), a review of mobile-assisted reading development from the Activity Theory perspective (Lin et al., 2020), a methodological review of qualitative research syntheses in CALL (Chong & Reinders, 2021), to name but a few key publications.

In contrast to these broader approaches to reviewing the literature in a field, some researchers have conducted research synthesis on a particular journal. For example, the only data source of Stapleton and Shao's (2018) study was the *Language Teaching Research (LTR)* journal, through which the researchers observed the research topic and trends over twenty years. Also, Ellis (2006), in an editorial (Vol. 10, Issue 4), addressed "corrective feedback," "instructional manipulation of learners' attention to form," and "the effects of instruction on L2 pragmatic development" (p. 357) only within the *LTR* journal. Chaudron (2007) reviewed the topical and methodological trends in language classroom research in *The Modern Language Journal (MLJ)* from 1916 to 2000. In another study, Byrnes (2002) investigated the role of linguistics and psychology in language education through a chronological overview in *MLJ*. The results of the abovementioned studies imply that research synthesis of published articles within a particular journal over a specific period can provide broader perspectives to

researchers about the topic under investigation, the fluctuations over time, and "how dynamics external to the field have had an influence" (Stapleton & Shao, 2018, p. 352).

The majority of CALL literature reviews have focused on the evolution of teaching methodologies. This focus is due to the immense integration of technology in both formal and informal educational settings in various contexts worldwide. Despite the growing institutional interest in CALL, researchers globally highlighted key prohibitive factors in the successful implementation of CALL, including individual teacher factors, contextual factors, and CALL teacher education (Hong, 2010).

The concentration of CALL TEPD programs should not only focus on the use of technology in its generic sense (Desimone & Garet, 2015; Gray et al., 2010), but also on the critical role of professional development programs have played in a) lessening teachers' affective factors (e.g., negative beliefs) (Dixon et al., 2014), b) changing their teaching philosophies (Hur et al., 2016), c) encouraging them to use their creativities, d) enabling them in CALL-based lesson planning, evaluation, and assessment, e) informing them about the inseparable interface between technology, pedagogy, and content, f) empowering them in redesigning materials for their purposes, among others (Tafazoli, 2021a).

The role of teachers in the successful integration of CALL is of paramount importance. Scholars around the world have focused broadly on the integration of technology into language teaching from different perspectives, including teacher education and teachers' professional development (Son, 2018; Torsani, 2016), challenges and affordances of the implementation of CALL in teachers' views (Liu & Chao, 2018), teachers' readiness and acceptance of using technology (Van Gorp et al., 2019). So far, only a few researchers have conducted a research synthesis on CALL TEPD. Examples include a critical review of emerging patterns around online language teacher education and its implication and efficacy between 2000 and 2016 in English language teaching by Shin and Kang (2018). Also, Nami (2021) conducted an extensive synthesis on EFL/ESL language teachers' CALL literacy in three CALL journals. Finally, Tafazoli's (2021) integrative review on the new literacies of language teachers in the published papers between 2010-2021 focused specifically on teachers' professional development. Thus, due to the inadequate research synthesis on CALL TEPD, I take this opportunity to investigate the position of such a critical CALL component in the two decades of the *TEwT* journal.

2. The study

The present study concentrates on one journal, *TEwT*, aiming to synthesize the published articles over twenty-one years to detect influential factors in CALL TEPD research. To meet the end, I followed Cooper's (1998) research synthesis steps: 1) the problem formulation, 2) data collection, 3) data evaluation, 4) data analysis and interpretation, and 5) the presentation of the results.

2.1. Data collection and evaluation

A common approach in the systematic literature reviews highlighted above is to search only for keywords and their combinations. In this paper, I was concerned about not missing any published articles. Therefore, I read all the 21 volumes, 82 issues, and 563 published documents to be assured of the included articles. In the first phase of identification, I specified the inclusion and exclusion criteria to be eligible for this study.

(1) I excluded all the editor's messages, internet lesson plans, reviews (i.e., website, software, and book reviews), a word from a techie, conference and seminar reports, IT English, on the web, guidelines, call for papers, and commentaries.

(2) The full-length article with an abstract should be accessible in the archive of the journal.

(3) There were no research design exceptions (i.e., review, qualitative, quantitative, or mixed methods).

Out of 563 published documents, 302 articles met the identification criteria. In the screening stage, I read the abstracts of all 302 articles to filter out the irrelevant ones. The irrelevant articles were those which do not cover the CALL TEPD. Thus, I identified only 20 articles out of 302. In the last phase of eligibility, I read the complete text of the remaining articles (N=20) to be included in the review for the coding procedure (Figure 1).

Identification
Documents identified through journal searching (N=563)

Screening
Documents meeting inclusion criteria (N=302)

Inclusion
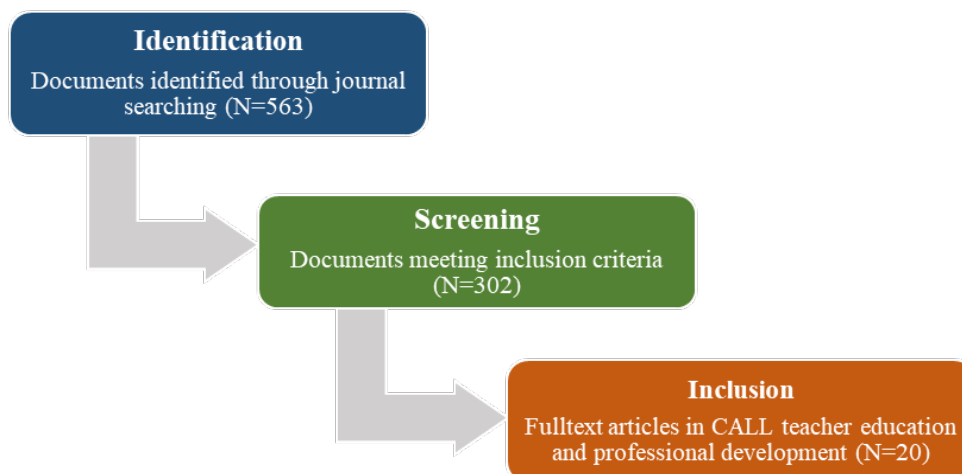Fulltext articles in CALL teacher education and professional development (N=20)

Figure 1. The stages of data evaluation

The eligible articles for the final inclusion in the review are illustrated in Table 1.

Table 1. Eligible and included articles focusing on CALL teacher education and professional development

Author(s)	Year	Title
Simpson, M. N.	2012	Esl@Facebook: A teacher's diary on using Facebook
Dashtestani, R.	2014	EFL teachers' knowledge of the use and development of computer-assisted language learning (CALL) materials
Karkour, I.	2014	A blended learning model for teaching reading in English as a foreign language
Xiaobin, L., Wei, Z., Huiwen, Z., & Lijun, J.	2014	Chinese EFL teachers' application of e-educology of foreign languages: An investigation based on TPACK framework
Shahrokni, S. A., & Sadeqjoola, L.	2015	Iranian EFL teachers' perception, familiarity and use of web 2.0 tools in TEFL
Silviyanti, T. M., & Yusuf, Y. Q.	2015	EFL teachers' perceptions on using ICT in their teaching: To use or to reject?
Boersma, E., & Getu, T.	2016	Ethiopian EFL teachers' perceptions and utilization of mediational potentials of the internet in ELT
Razak, R. A., Kaur, D., Halili, S. H., & Ramlan, Z.	2016	Flipped ESL teacher professional development: Embracing change to remain relevant
Kruk, M.	2017	Prospective teachers' experiences in using second life for learning and teaching English
Cote, T., & Milliner, B.	2018	A survey of EFL teachers' digital literacy: A report from a Japanese university
Muslem, A., Yusuf, Y. Q., & Juliana, R.	2018	Perceptions and barriers to ICT use among English teachers in Indonesia
Prasojo, L. D., Mukminin, A., Habibi, A., Marzulina, L., Sirozi, M., & Harto, K.	2018	Learning to teach in a digital age: ICT integration and EFL student teachers' teaching
Dashtestani, R.	2020	Online English for academic purposes instruction in the context of Iran: Exploring the instructor element
Hidalgo, F. J. P., Parra, M. E. G., & Abril, C. A. H.	2020	Digital and media competences: Key competences for EFL teachers
Love, M.	2020	How EFL teacher trainees in a TESOL graduate program integrate tools and platforms into teaching EAP
Fernández-Carballo, M. V.	2021	Prospective primary school EFL teachers' beliefs about "flipping"
Mulyono, H., Ismayama, D., Liestyana, A. R., & Komara, C.	2021	EFL teachers' perceptions of Indonesian blended learning course across gender and teaching levels
Thumvichit, A.	2021	English language teaching in times of crisis: Teacher agency in response to the pandemic-forced online education
Meihami, H.	2021	A narrative inquiry into Iranian EFL teacher educators' voice about challenges of CALL teacher education
Quintanilla Espinoza, A., & Kloss Medina, S.	2021	Understanding in-service teachers' learning experience while developing an electronic portfolio

2.2. Data analysis

In order to systematically conduct the research synthesis, I utilized the modified version of Tafazoli's (2021b) categorization template. Tafazoli (2021b) included literacy and the definition of literacy as the main elements. However, in this paper, the terms are well-known and already defined; hence, the final template consists of (1) Aim of the study, (2) Research questions, (3) Keywords, (4) Technology, (5) Data collection, (6) Research design, (7) Target language, (8) Context of the study (participants, country), (9) Theoretical assumptions, and (10) Research focus. In addition, I included two new categories of (11) Publication year and (12) Authors' affiliations to find out about the progress and trend of CALL TEPD over the last two decades.

Then, to analyze the collected data, I employed content analysis due to the nature of the study and its flexibility (Cavanagh, 1997). According to Krippendorff, content analysis is "an unobtrusive technique that allows researchers to analyze relatively unstructured data in view of the meanings, symbolic qualities and expressive contents they have and of the communicative roles they play in the lives of the data's sources" (as cited in Merriam & Tisdell, 2015, p. 179). I started with reading and rereading the eligible published articles individually to establish the initial codes. After that, I asked two colleagues (a Ph.D. and an M.A. holder in English Language Teaching) to recheck the initial codes. After reaching the consensus on the initial codes in the second phase, several themes have been developed and classified based on their similarities.

3. Results

This section gives the results that were found from the selected published articles focusing on CALL TEPD.

3.1. Demographics of the studies

The continuous growth in the number of published articles concentrating on CALL TEPD is evident in Figure 2. To have a better insight into the positive or negative progress of the research focus on CALL TEPD, I divided the two decades into four 5-research periods and included the last year (i.e., 2021). The descriptive analysis revealed that no article had dealt with CALL TEPD in the first ten years. The first article was published in 2012 and peaked at nine in the five years from 2016 to 2020. The results revealed that the number of published articles in the year 2021 was five (25%), which emphasized the significance of CALL TEPD that grasped the CALL researchers' attention. Therefore, I expect more studies will be conducted after 2021.
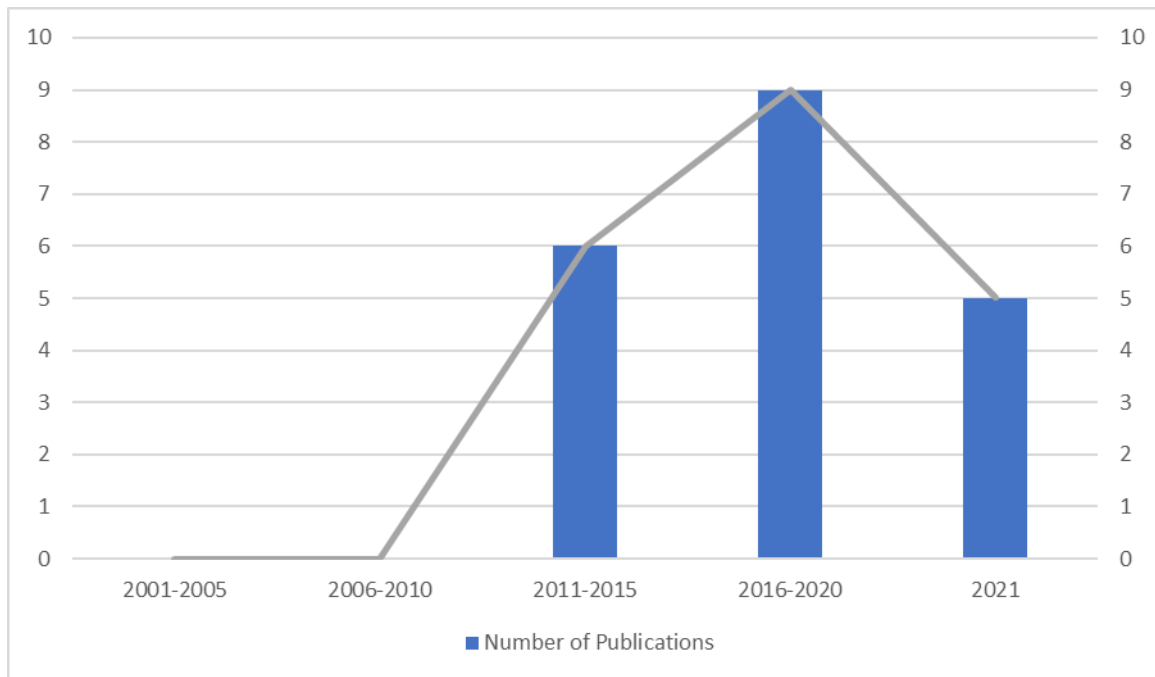
Figure 2. Number of publications

To better interpret the focus of CALL researchers, Figure 3 shows the distribution of the published articles across the globe. In the analysis of the 20 included articles, most of the studies were performed in Asia (N=13). Iran and Indonesia, with four publications, are the main contexts where were the focus of CALL researchers in the journal. CALL researchers had also investigated other contexts of Chile, China, Ethiopia, Japan, Malaysia, Poland, and South Korea, with only one published article each. It should be noted that I excluded three articles by Egyptian (Karkour, 2014), Malaysian (Razak et al., 2016), and Spanish (Hidalgo et al., 2020) researchers that were review articles; because these review articles had no role in the current context of this study. In Figure 3, Love's (2020) study is not presented as the participants of this study were from various contexts of South Africa, the UK, the US, Australia, China, Canada, Ireland, and Uzbekistan.

Figure 3. Context-based distribution of published articles

3.2. Research methodologies

A diversity of research methodologies was applied in the included articles. The articles fall within four main categories: a) qualitative, b) quantitative, c) mixed-methods, and d) review, position, and discussion. Most of the included articles are empirical studies (using all kinds of quantitative, qualitative, or mixed methods) (N=17), and only three articles focused on a review, position, or discussion article.

As illustrated in Figure 4, half of the studies were conducted using a mixed-methods research design (N= 10) which combines both quantitative and qualitative approaches. Four studies were qualitative (using participatory action research, narrative inquiry, and longitudinal and practitioner research approach), three were quantitative (using surveys), and three of them were review and position articles. Questionnaires (including open- and closed-ended questions) and/or semi-structured interviews were the most recurrent instruments. Less frequent instruments for data collection were journal writing, video-based observation, focus group discussion, narratives, non-participants observations, and student-generated teaching suggestions (SGTSs) that were mostly used in qualitative research. In general, large-scale studies are prevalent, usually following a mixed-methods design (N= 7), but also it was possible to identify qualitative (i.e., Prasojo et al., 2018) and quantitative studies (e.g., Mulyono et al., 2021).
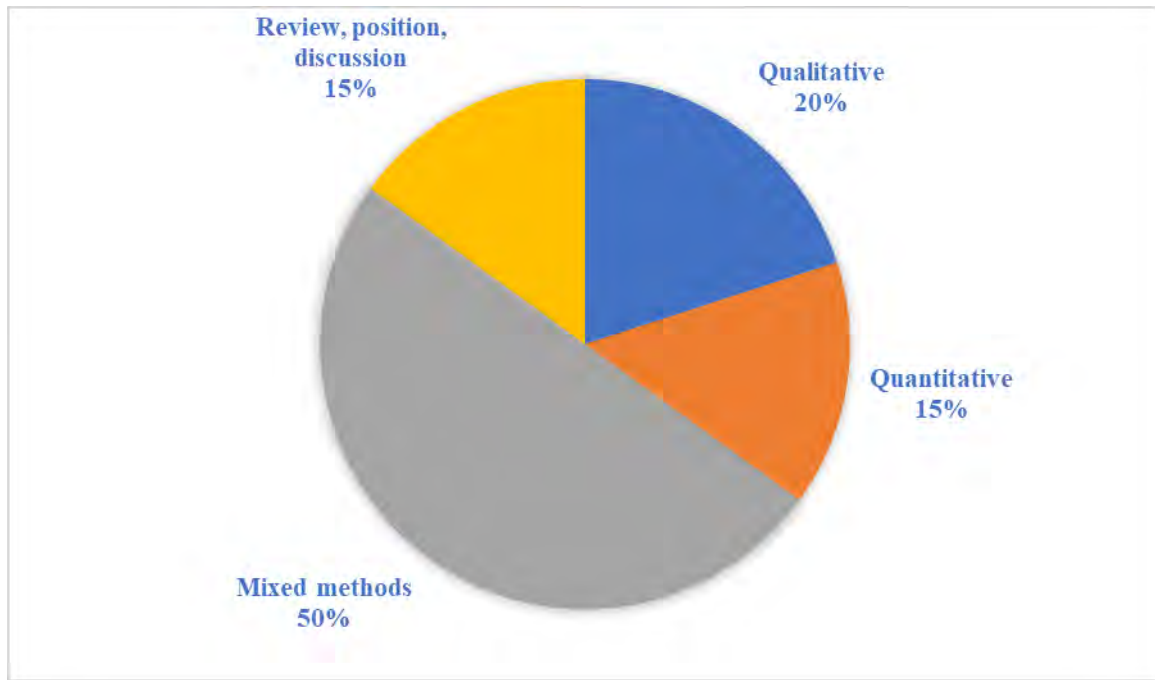
Figure 4. Research methodologies

3.3. Focus of the studies

In-service teachers were the most recurrent participants (73.05% of the samples). Data analysis showed that 38.45% of them were higher education teachers, including EFL teachers (30.76%) and English for Academic/Specific Purposes (EAP/ESP) teachers (7.69%). Language teachers in primary and secondary education were 23.07% of the sample, and language institute teachers were 11.53%. Pre-service EFL teachers were 15.38% of the samples, and the remaining 11.53% of the sample were higher education teacher educators and EFL teacher trainers (Table 2).

Table 2. Research focus

Focus			Freq.	%
In-service teachers	Higher education	EAP/ESP	2	7.69%
		EFL	8	30.76%
	Primary and secondary education	EFL	6	23.07%
	Language institutes	EFL	3	11.53%
Pre-service teachers			4	15.38%
Others	University teacher educators		2	7.69%
	EFL teacher trainers		1	3.84%

3.4. Themes emerging from the research synthesis

Concerning the research focus, most of the studies focused on participants' perceptions, attitudes, and experiences most of which were related to practicum and the CALL tools and programs. Moreover, teachers' knowledge, literacies, and skills were highly acknowledged by

the researchers. CALL affordances and hindrances were also among the most frequent topics under investigation.

A topic that has been the attention of authors over several years has been *teachers' perceptions, attitudes, and experiences* with CALL. In general, the results of the reviewed articles showed that English language teachers have positive perceptions about CALL materials (Dashtestani, 2014), applying e-educology (Xiaobin et al., 2014), Web 2.0 technologies (Shahrokni & Sadegjoola, 2015), mediational potentials of the internet (Boersma & Getu, 2016), ICTs (Muslem et al., 2018; Silviyanti & Yusuf, 2015), online instruction (Dashtestani, 2020), flipped classroom (Fernández-Carballo, 2021), and blended learning Mulyono et al. (2021). Also, the positive perception is not limited to a specific group of English teachers, and it includes a broad range of EFL university teachers (Boersma & Getu, 2016; Dashtestani, 2014; Silviyanti & Yusuf, 2015), EAP/ESP university teachers (Dashtestani, 2020), primary and middle school teachers (Dashtestani, 2014; Fernández-Carballo, 2021; Muslem et al., 2018; Shahrokni & Sadegjoola, 2015; Xiaobin et al., 2014), language institute teachers (Dashtestani, 2014), university teacher educator (Dashtestani, 2014), and teacher trainers (Dashtestani, 2014).

Along with the included articles, a substantial body of research highlighted the significance of attitude by acknowledging that the positive attitude or perception is assumed as one of the main driving factors in the actual use of CALL by teachers (Albrini, 2006; Kessler, 2007; Liu et al., 2017; Raygan & Moradkhani, 2020). However, having positive attitudes per se does not guarantee teachers' readiness to use CALL, and teachers should be competent in implementing CALL. CALL TEPD is a way that teachers can train and upskill themselves. Thus, the *required knowledge, skills, and literacies for teachers* has been another trend in CALL across the years in the *TEwT*.

Considering the research focus's shift from the necessity of using CALL to "how, when, and for what purpose" (Nami, 2021, p. 578), only three studies concentrated on teachers' digital literacies (Cote & Milliner, 2018), digital and media competences (Hidalgo et al., 2020), and agency (Thumvichit, 2021). Among them, Cote and Milliner (2018) investigated 42 university teachers' digital literacies in Japan using Son et al.'s (2011) questionnaire. The descriptive data analysis revealed that teachers are confident in using digital technologies. Also, Hidalgo et al.'s (2020) review showed that digital and media competencies are two vital key elements for lifelong training.

The scarcity of studies on teachers' required knowledge and competencies emphasizes the need for more research on reaching a consensus on what are the technological and

pedagogical necessities for teachers. Because using various technologies is not the sole goal, but the successful implication in conveying the content through appropriate pedagogy should be the ultimate goal which Mishra and Koehler (2006) call Technological Pedagogical Content Knowledge (TPACK). In other words, "there should be appropriate and up-to-date training courses for teachers with two aims: 1) to improve their digital or any related new literacies, and 2) to teach teachers how to transfer their new literacies into the real teaching situations" (Tafazoli, 2021, p. 604). Thus, along with the positive attitudes and perceptions, teachers are required to develop their literacies, skills, and competencies to be able to be competent teachers (Fathi & Ebadi, 2020), and apply the competencies in their real teaching practices.

CALL practicum has been the attention of research over several years and is based on the various CALL tools and approaches, such as Facebook (Simpson, 2012), Second Life (Kruk, 2017), e-portfolio (Espinoza & Medina, 2021), blended learning (Karkour, 2014), and flipped learning (Razak et al., 2016). Simpson (2012) applied qualitative action research to find out the potential of Facebook for teaching English language to Korean students. Her journal writing focused on student-student and student-teacher interactions, lesson planning, and teaching. Simpson, a language teacher at a university in South Korea, wrote her reflections for an hour on the weekend. Although the teacher-researcher did not explain the data analysis, she reported interesting findings. The researcher highlighted some issues in using Facebook as a teaching tool: a) Lesson planning is difficult due to its system upgrading and refreshing on a regular basis, b) Grading is overwhelming, c) Giving feedback to all students is time-consuming and sometimes overlooked, and d) (Self)training is required to be a confident user.

Kruk (2017) explored the experiences of pre-service teachers in using Second Life to find out its potential use in English language teaching. The researcher used questionnaires to collect data from 15 female pre-service teachers in Poland. The participants believed that the utilization of Second Life might be favorable in learning communication, vocabulary and phrases, and writing through chat functions. Also, they found the virtual world as a stress-free speaking environment. In contrast, they mentioned some drawbacks such as wrong and inaccurate use of English (e.g., rude and improper words). In another study, Prasojo et al. (2018) conducted a qualitative case study to understand the perceptions of 60 pre-service teachers about ICT integration in teaching practices. Observing the recorded videos showed that only 12 participants used technology (i.e., laptops, projectors, smartphones) in their teaching.

Through a longitudinal and practitioner research approach, Love (2020) measured how pre- and in-service EAP teachers in a TESOL graduate program employ technology in their

courses. He used student-generated teaching suggestions (SGTSs) for data collection. The participants suggested using a) locally popular technologies such as imo, QQ, Telegram, and WeChat, b) YouTube for the authentic target language, c) patch notes for teaching skimming/scanning, d) podcasts, e) media ethnography of online communities and video games, f) search engines for teaching (critical) EAP, g) online websites and communities for teaching EAP in a post-truth world, among others.

In a cross-sectional survey research design, Espinoza and Medina (2021) investigated the primary and secondary EFL teachers' learning experiences while developing an e-portfolio in Chile. The applied survey contains 15 Likert scales, five checkboxes, and three open-ended questions. Data analysis revealed that teachers felt that e-portfolio is an effective CALL tool. Also, they mentioned that an e-portfolio is an authentic, process-oriented, and reflective assessment tool. Teachers also preferred using e-portfolio to document or collect their learning experiences and self-reflect on their teaching and learning. For the advantages of developing the e-portfolio, data analysis revealed teachers could learn about technology, and use it as a useful tool for assessment. Also, teachers find e-portfolio portable, easy to access, and updated. In contrast, they said that developing an e-portfolio is time-consuming, teachers lack technological skills, and the server space is limited.

Finally, most of the included articles investigated the *affordances and hindrances of CALL* through the lens of pre- and in-service teachers and/or teacher educators/trainers. For example, in a qualitative study, Dashtestani (2014) analyzed the benefits and challenges of CALL materials development from the viewpoints of Iranian EFL university teachers (N=51), high school teachers (N=39), language institute teachers (N=118), university teacher educators (N=15), and teacher trainers (N=32). The participants counted the benefits of CALL materials such as authenticity, interactivity, accessibility, facilitating, and attractiveness, among others. Also, they stated that CALL materials increase teachers' and students' impetus and confidence to have more effective teaching. The participants mentioned that although developing CALL materials is not an undemanding activity, developing CALL materials by teachers is important in EFL teachers' professional development. However, the participants encountered some challenges, including lack of expertise, required skills, time, training, funding, and technological facilities. Also, they complained about cultural resistance to using CALL materials and a lack of obligation to integrate CALL materials into the syllabus.

CALL tools and programs had many advantages for teachers. Data analysis established that CALL tools and programs a) increase in teachers' motivation (Dashtestani, 2014), confidence (Dashtestani, 2014), teaching efficiency (Prasojo et al., 2018; Xiaobin et al, 2014)

and performance (Silviyanti & Yusuf, 2015), b) make teaching funny (Xiaobin et al., 2014), easy (Dashtestani, 2020; Silviyanti & Yusuf, 2015; Xiaobin et al., 2014), interesting (Muslem et al., 2018), attractive (Prasojo et al., 2018), learner-centered (Dashtestani, 2020; Fernández-Carballo, 2021), and motivational (Mulyono et al., 2021), c) present knowledge in various forms (Prasojo et al., 2018; Xiaobin et al., 2014), d) improve students' autonomy (Dashtestani, 2020; Fernández-Carballo, 2021), responsibility (Dashtestani, 2020) and learning (Kruk, 2017; Prasojo et al., 2018; Silviyanti & Yusuf, 2015), e) provide a stress-free environment (Kruk, 2017), f) obtain information easily and swiftly (Muslem et al., 2018; Prasojo et al., 2018) through electronic resources (Dashtestani, 2020), g) give more authentic and cutting-edge information (Dashtestani, 2020; Prasojo et al., 2018), h) provide opportunities for international academic communities (Dashtestani, 2020), i) foster teachers' digital literacy (Dashtestani, 2020), and j) available based on the needs (Fernández-Carballo, 2021; Mulyono et al., 2021).

Despite its advantages, many teachers complained about the challenges of using CALL tools and programs: a) teachers' lack of expertise, required skills, knowledge, and competences, experience (Boersma & Getu, 2016; Cote & Milliner, 2018; Dashtestani, 2014, 2020; Espinoza & Medina, 2021; Muslem et al., 2018; Silviyanti & Yusuf, 2015; Xiaobin et al., 2014) b) teachers' heavy burdens (Boersma & Getu, 2016; Cote & Milliner, 2018; Dashtestani, 2014; Espinoza & Medina, 2021; Fernández-Carballo, 2021; Xiaobin et al., 2014), c) insufficient funding (Dashtestani, 2014; Muslem et al., 2018; Xiaobin et al., 2014), d) lack of technological facilities (e.g., software, hardware, internet) (Cote & Milliner, 2018; Dashtestani, 2014, 2020; Kruk, 2017; Muslem et al., 2018; Prasojo et al., 2018; Shahrokni & Sadeqjoola, 2015; Xiaobin et al., 2014), e) cultural resistance (Dashtestani, 2014; Prasojo et al., 2018), f) lack of obligation to integrate CALL in syllabus and curriculum (Cote & Milliner, 2018; Dashtestani, 2014, 2020), g) low teaching effect (Xiaobin et al., 2014), h) teacher's backward notion (Xiaobin et al., 2014), i) managers' and leaders' weak determination (Silviyanti & Yusuf, 2015; Xiaobin et al., 2014) and reluctance to invest in new technologies (Shahrokni & Sadeqjoola, 2015), j) lack of teacher training programs (Dashtestani, 2014, 2020; Mulyono et al., 2021; Muslem et al., 2018; Shahrokni & Sadeqjoola, 2015; Silviyanti & Yusuf, 2015; Xiaobin et al., 2014), k) students' lack of computer literacy (Shahrokni & Sadeqjoola, 2015) and internet skills (Boersma & Getu, 2016; Dashtestani, 2020), l) costs and expenses (Silviyanti & Yusuf, 2015), m) inflexible teaching methods (Cote & Milliner, 2018), n) lack of instant feedback (Fernández-Carballo, 2021), o) students' responsibility for their own work and pointed out that it is easier for them to get frustrated (Fernández-Carballo, 2021), r) difficulty in motivating students (Mulyono et al., 2021), and p) technical issues (e.g., blackouts, internet connections)

(Boersma & Getu, 2016; Cote & Milliner, 2018; Fernández-Carballo, 2021; Mulyono et al., 2021; Muslem et al., 2018; Prasojo et al., 2018; Shahrokni & Sadeqjoola, 2015; Silviyanti & Yusuf, 2015).

Finally, focusing on CALL teacher educators, Meihami (2021) enumerated some challenges, including insufficient time and infrastructures, insufficient standards, lack of established methodology, teachers' inertia ("EFL teacher educators' belief that they did not need to change their current EFL teacher education to a CALL-oriented one") (p. 103), lack of EFL teachers' motivation to take part in CALL TEPD, lack of qualified CALL educators, and ignoring CALL by EFL teacher educators.

As illustrated in Figure 5, it can be concluded that a successful CALL TEPD should be based on the context by considering influential contextual factors on teachers' success. Also, it should be based on the needs nested in the context, which might differ from context to context. Moreover, according to the study's findings, three components of CALL literacy, CALL practicum, and affective factors should be the focus of CALL TEPD courses.
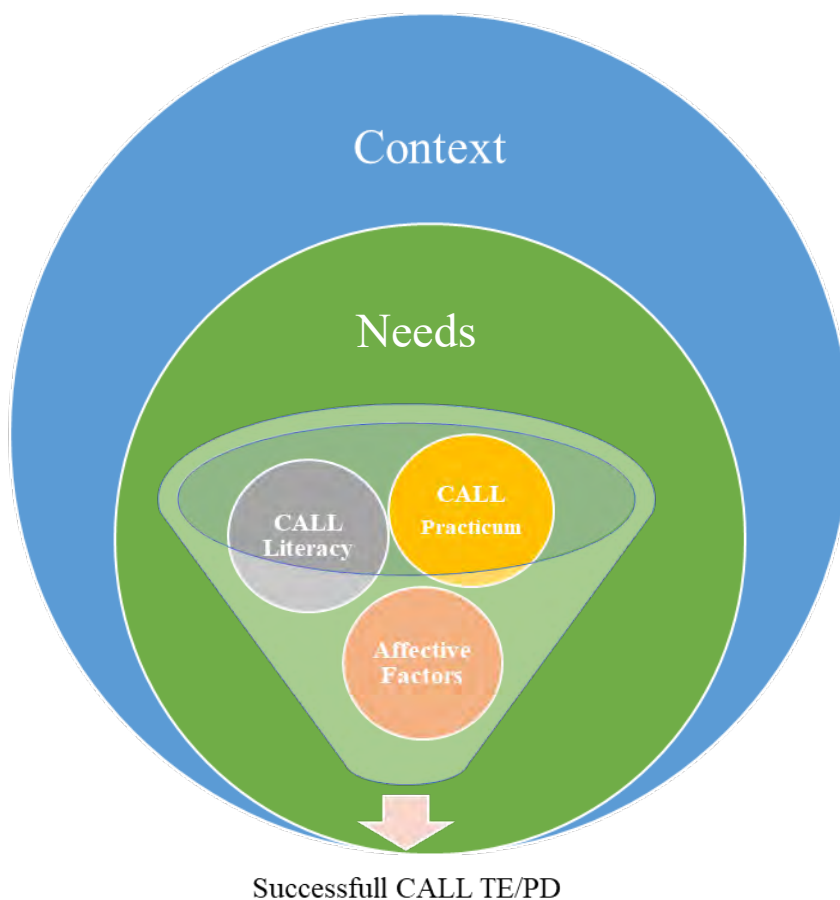

Figure 5. Influential factors in successful CALL teacher education and professional development

5. Concluding remarks

In this review, I have synthesized the scholarship on CALL teacher education and professional development in the *Teaching English with Technology* journal from 2001 to the end of 2021. As I read the articles, I observed an unprecedented growth of CALL TEPD articles, especially in the last decade, which shows the significance of this topic. I believe the unexpected and unpredicted situation of language education amid the COVID-19 led to the use of technology at its maximum level. We should expect even more articles on CALL TEPD in the next decade. The findings showed that language teachers should develop their CALL literacy apart from contextual challenges (e.g., lack of infrastructure). Teachers should develop their CALL literacies by participating in professional development courses which a) lessen their affective factors (e.g., negative beliefs) and cultural resistance, b) increase their motivation, confidence, teaching efficiency and performance, c) help them to make their teaching interesting, easy, attractive, learner-centered, and motivational, d) enable them to improve students' autonomy, responsibility, and learning, e) empower them to use CALL tools and materials, f) change their teaching philosophies, d) inform them about the inseparable interface between technology, pedagogy, and content, and e) empower them in redesigning materials for their purposes.

Reaching the CALL TEPD courses with such criteria would be impossible without establishing the appropriate frameworks, standards, and methodologies to train qualified CALL educators and teachers. In this vein, EFL authorities and decision-makers should provide more funding and technological facilities. Also, they should make some necessary changes in the syllabuses and curriculums to integrate more CALL materials and push the managers and leaders to invest in new CALL tools and materials. In other words, the attitude toward CALL should be changed from an add-on component to a normalized part of language education. I also believe that CALL researchers and teacher-researchers should keep on exploring the applicable tools and materials, appropriate delivery methods, teachers' and students' needs, and challenges to reach the CALL normalization in our field.

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