



Language Teachers' Professional Development and New Literacies: An Integrative Review

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ABSTRACT

The aim of this paper is to synthesise the themes and topics addressed language teachers' new literacies in the published articles between 2010–2020 to understand research and approaches to the new literacies of language teachers. To this end, the researchers applied an integrative review of 29 papers selected from a body of 503 published papers in nine databases. The review showed that most papers related to new literacies in professional development focused on the term digital literacy. Moreover, most of the published papers are from Asia and Europe and were conducted on in-service teachers. A great majority of published papers relied on qualitative research design, and web 2.0 technologies are the dominant technologies in the reviewed studies. My findings potentially pave the way for future researchers to recognize and classify new possible areas of research as regards the use of new literacies as a necessity for language pedagogy.

Keywords: Professional development, New literacies, language teachers, integrative review.

Desarrollo profesional de profesores de idiomas y nuevas alfabetizaciones: Una revisión integradora

RESUMEN

El objetivo de este trabajo es sintetizar los temas que abordan las nuevas alfabetizaciones de los profesores de idiomas en los artículos publicados entre 2010-2020 para comprender la investigación y los enfoques de las nuevas alfabetizaciones de los profesores de idiomas. Para ello, los investigadores aplicaron una revisión integradora de 29 artículos seleccionados de un conjunto de 503 artículos publicados en nueve bases de datos. La revisión mostró que la mayoría de los artículos relacionados con las nuevas alfabetizaciones en el desarrollo profesional se centra en el término "alfabetización digital". Además, la mayoría de los trabajos publicados proceden de Asia y Europa y se realizaron con profesores en activo. La gran mayoría de los trabajos publicados se basan en un diseño de investigación cualitativo, y las tecnologías de la web 2.0 son las dominantes en los estudios revisados. Nuestros hallazgos pueden allanar el camino para que los futuros investigadores reconozcan y clasifiquen nuevas áreas posibles de investigación en lo que respecta al uso de las nuevas alfabetizaciones como una necesidad para la pedagogía del lenguaje.

Palabras clave: Desarrollo profesional, nuevas alfabetizaciones, profesores de idiomas, revisión integradora.



Introduction

In everyday life, we have moved from text-based interactions to operating in a multi-modal environment. This transition has led to an alteration in the traditional concept of literacy from 'the ability to write and read' to the new literacies variously called 'multiliteracies' (Gee, 1992), 'multimedia literacy' (New London Group, 1996), 'technological literacies' (Lankshear et al., 1997), 'silicon literacies' (Snyder, 1997), 'electronic literacy' (Warschauer, 1999), 'technoliteracy' (Erben, 1999), 'new literacy/literacies' (Salaberry, 2000), 'multiple literacies' (Kellner, 2002), 'electracy' (Ulmer, 2003), and 'online literacy' (Snyder & Beavis, 2004). A common term used for these new literacies is 'digital literacy'. Digital literacy is "an ability to interpret, manage, share and create meaning in the growing range of digital communication channels" (Tafazoli et al., 2017, p. 716) which delineated as a 'survival skill' (Eshet-Alkalai, 2004) in our digital age.

In this new environment, language teachers need to acquire and be able to teach more than just so-called '21st-century skills' such as creativity and innovation, collaboration and teamwork, critical thinking, problem-solving, autonomy, flexibility, and lifelong learning (Dudeney et al., 2013), they also need to be proficient in the new literacies as described above. Using technologies, however, is not the ultimate goal of teacher education. The increasing interest in applications of technology in language education has necessitated language teachers to become competent in applying technology in their classrooms. Successful implementation of technology in language teaching curriculum requires literate teachers in knowing how to apply the technology to meet their needs. However, 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.

Various scholars around the world have investigated the integration of technology into language teaching from different perspectives including teacher education and professional development (Aşik et al., 2020; Nazari & Xodabande, 2020; Son, 2018), challenges and affordances of the implementation of CALL in teachers' views (Liu & Chao, 2018; Xu & Churchill, 2020), teachers' readiness and acceptance of using technology (Van Gorp et al., 2019), and teachers' attitudes and perceptions (Tafazoli et al., 2019). However, only a few scholars have tried to explicate the role of new literacies in language teacher education and teacher's professional development (e.g., Allen & Berggren, 2016; Almås & Krumsvik, 2007; Benitt et al., 2019). An initial review of literature showed that researchers investigated new literacies from different perspectives of material development (Allen, 2015), teachers' professional development in general (Anderson et al., 2018), rural teachers' professional development (Cruz Arcila, 2018), online professional development (Albers et al., 2015), teachers' attitudes and perceptions (Ryo & Boggs, 2016; Tok, 2015; Xerri & Campbell, 2016), multilingual education (Dagenais et al., 2017), teacher training (Dashtestani, 2014; Hauck, 2019; Zacchi, 2018), pre-service teacher education (Jeong, 2017; Ozden, 2018), in-service teacher education (Yi & Angay-Crowder, 2016), curriculum development (Jiang, 2019), teacher researcher (Knobel & Lankshear, 2019), teachers' professional identity (Norton & Early, 2011), teaching assistant program (Soler & Tecedor, 2018), and intercultural competence (Waldman et al., 2019).

Due to the lack of focus on the concept of teachers' new literacies, in general, and language teachers' new literacies, in particular, this research aims to contribute to a state-of-the-art study on language teachers' professional development and new literacy. Thus, in order to grasp the attention of teacher educators, researchers, decision-makers, and policymakers in language educa-

tion to value new literacy for teachers' professional development as a lifelong plan at both individual and organizational levels, the researchers carried on an integrative review of the related literature. In this review, we scrutinized the themes and topics addressed language teachers' new literacies in the last decade, between 2010 – 2020, to provide an apprehension of research and approaches to the new literacies of language teachers. The aim of this review is to analyze journal articles that define or discuss the concepts of new literacies in relationship to teachers' professional development and education.

Method

The researchers applied an integrative review based on five phases of research synthesis (Cooper, 1998): (1) formulating the problem; (2) collecting data; (3) evaluating data; (4) analysing and interpreting; and (5) presenting the results.

The Data Collection

In the phase of data collection, the researchers, first, search for published journal articles related to the aim of this study from several scholarly sources including (1) academic journals, (2) bibliographic databases, (3) review articles, and (4) the electronic databases. The second phase of the data collection dealt with specifying the inclusion and exclusion criteria.

In order to access the related studies, the researchers specified related keywords and subject words to find out relevant studies based on previous studies. The keywords were based on the 'view of literacy' table published by Tafazoli and his colleagues in 2017. The primary keywords and subject words applied in combination with 'language teaching' were: (1) computer literacy, (2) digital literacy, (3) electracy, (4) electronic literacies/literacy, (5) eLiteracy, (6) ICT literacy, (7) media literacy, (8) multiliteracies, (9) multimedia literacy, (10) multiple literacies, (11) new literacies, (12) online literacy, (13) silicon literacies, (14) technoliteracy, and (15) visual literacy. Then, the mentioned keywords and combinations were used in electronic bibliographic databases which include: (1) Academic Search Ultimate (EBSCO HOST), (2) Arts & Humanities Citation Index (AHCI), (3) Educational Resource Information Center (ERIC), (4) Emerging Source Citation Index, (5) JSTOR, (6) Project Muse, (7) Science Citation Index Expanded, (8) Scopus, and (9) Social Science Citation Index (SSCI).

The researchers also tried to expand their data collection by searching the reputable academic journals in language teaching and learning, education, literacy, and teacher education included: (1) Applied Linguistics, (2) Australasian Journal of Educational Technology, (3) British Journal of Educational Technology, (4) CALICO Journal, (5) Computer Assisted Language Learning, (6) Computers and Education, (7) ELT Journal, (8) Foreign Language Annuals, (9) Journal of Adolescent and Adult Literacy (ILA), (10) Journal of Education for Teaching, (11) Journal of Learning, (12) Journal of Teacher Education, (13) Language Learning & Technology, (14) Language Teaching Research, (15) ReCALL, (16) Second Language Research, (17) Studies in Second Language Acquisition, (18) System, (19) Teachers and Teaching, (20) Teaching and Teacher Education, (21) TESOL Quarterly, and (22) The Modern Language Journal.

Inclusion and Exclusion Criteria

In the first attempt to find the relevant research papers, 490 studies were identified based on the mentioned keywords in the mentioned databases and journals. To be eligible for this study, the researchers specified inclusion and exclusion criteria:

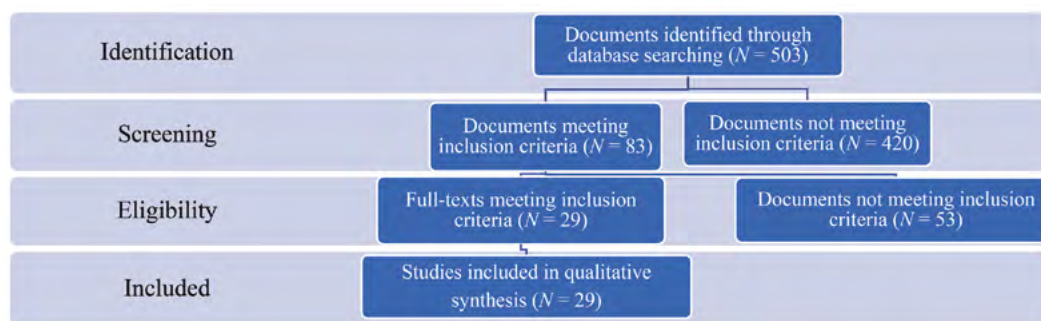


Figure 1. Data Evaluation Stages

(1) The publication date must be between 2010 and 2020. The last decade was chosen based on the emergence of technology in language teaching and as we wanted to investigate the latest development of the concept of digital literacy. (2) The study adopted any terms called 'new literacies' (Tafazoli et al., 2017) with the same definition of 'digital literacy' – mentioned in the introduction section. (3) The studies must be published journal articles with no research design exceptions (qualitative, quantitative, or mixed methods). (4) The study covers the digital literacy of language teachers. Finally, (5) the participants in the studies had to be second, foreign and/or additional language teachers.

Data Evaluation

Figure 1 illustrates several screening processes and selecting acceptable published papers based on the inclusion and exclusion criteria for inclusion in this review. The researchers specified three screening phases for all the identified papers in the first phase through the database search engines. In the first phase, the screening happened to remove the duplicate and irrelevant papers based on the titles and keywords. In the second phase, the researchers read all the abstracts to filter out the irrelevant papers.

In the third phase, the researchers read through all the remaining papers' full texts to meet the inclusion and exclusion criteria.

The number of accepted papers in the first two phases of the study based on the databases and literacy types is illustrated in Table 1.

Data Analysis

We decided to perform an integrative review because 29 documents were not homogenous enough to warrant a meta-analysis. However, the included studies and demographics of the included documents such as year, geographical area, the study context, number of participants, research design, and target language were reported in quantitative data. In addition, a qualitative analysis of each study was done, based on Manca and Ranieri's (2016) technique, we conducted a qualitative analysis of each of the studies regarding aims, keywords, the technology used, data collection, design of the study, literacies, definitions of literacies, target language, the context of the study, and theoretical framework.

In the first step, in order to systemize the documents, we designed a categorization template to follow the scientific approach in the documents. Apart from recognizing the type of literacies

Table 1. Number of Accepted Papers based on the Databases and Keywords

	EBSCO		ERIC		JSTOR		Project Muse		Scopus		WOS	
	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2
Computer literacy	6	1	6	4	18	2	1	0	0	0	1	0
Digital literacy	14	6	7	5	38	2	11	3	9	2	25	5
Electronic literac*	4	0	0	0	2	0	0	0	0	0	1	0
ICT literacy	6	2	0	0	1	0	0	0	0	0	0	0
Media literacy	3	2	5	1	16	1	5	0	5	0	5	0
Multiliteracies	25	9	6	2	58	2	20	0	14	2	30	7
Multimedia literacy	9	3	0	0	23	1	23	1	0	0	1	1
Multiple literacies	5	0	12	3	39	4	1	0	2	0	1	0
New literacies	8	2	17	5	29	0	5	0	5	2	7	1
Online literacy	23	1	0	0	1	0	0	0	0	0	0	0
Technoliteracy	0	0	0	0	1	0	0	0	0	0	0	0
Visual literacy	3	0	1	0	15	1	0	0	1	0	2	0
Total	106	26	54	20	241	13	66	4	36	6	73	14

* Truncation
P = Phase

used in the documents, which was the focus of the study, we were eager to know about the researchers' aims and whether they have contributed to the knowledge of new literacy by adding new definitions or new terms. Also, we were interested in the research design, data collection tools, and the context of the studies. Thus, the categorization template consisted of the following:

- (1) Aim of the study
- (2) Research questions
- (3) Keywords
- (4) Literacy
- (5) Definition of literacy
- (6) Technology
- (7) Data collection
- (8) Design
- (9) Target language
- (10) Context of the study (participants, country)
- (11) Theoretical assumptions
- (12) Research focus

In the next step, we applied multilevel coding (Birks & Mills, 2011) in which different themes have emerged from each specific category based on a grounded theoretical approach. In this way of coding, the specified codes were classified based on their similar specifications to generate fully developed individual categories (Strauss & Corbin, 1990). Table 2 shows the number of accepted papers in the third phase of data evaluation using a content analysis approach.

Table 2. Number of Accepted Papers for Each Journal

Journal	No*
ELT Journal	3
TESOL Quarterly	2
Language and Education	2
The JALT CALL Journal	2
European Journal of Language Policy	2
The European Journal of Applied Linguistics and TEFL	2
Computer Assisted Language Learning	1
CALICO Journal	1
The Modern Language Journal	1
English Language Teaching	1
Language Teaching Research	1
Journal of Adolescent & Adult Literacy	1
Profile: Issues in Teachers' Professional Development	1
International Journal of Progressive Education	1
Advances in Language and Literary Studies	1
e-TEALS: An e-journal of Teacher Education and Applied Language Studies	1
Center for Educational Policy Studies Journal	1
International Electronic Journal of Elementary Education	1
Hispania	1
Revista Tempos E Espacos Educacao	1
Td-the Journal for Transdisciplinary Research in Southern Africa	1
International Journal of English Linguistics	1
Total	29

* Number of articles included in this review

Results and Discussion

In this section, we demonstrated the findings that were obtained from the selected published articles concentrating on teachers and the development of their new literacies.

Demographics of the Studies

The data analysis revealed a continuous growth in the number of published papers from 2010 to 2020. By dividing this decade into two 5-year-research periods, the number of publications rose from 8 articles (27.6%) in the first five-year (2010-2015) to 21 articles (72.4%) in the second period (2016-2020). On average, two or three studies were published each year, and the number of studies reached their peak in 2018 (Figure 2). However, as the study was completed in June 2020, the researchers expect more publications on the issue in 2020.

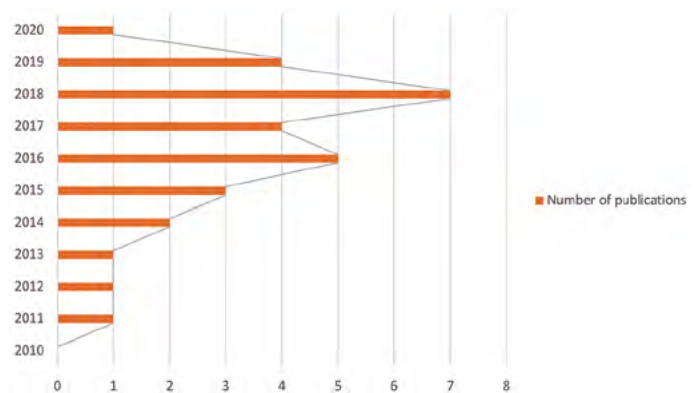


Figure 2. Number of Publications Each Year

As for the distribution of published studies across the globe, eight studies were carried out in Europe and seven studies in Asia. America with five and Africa with two studies are in the next ranking, and, surprisingly, no study has been conducted in Australia (Figure 3).

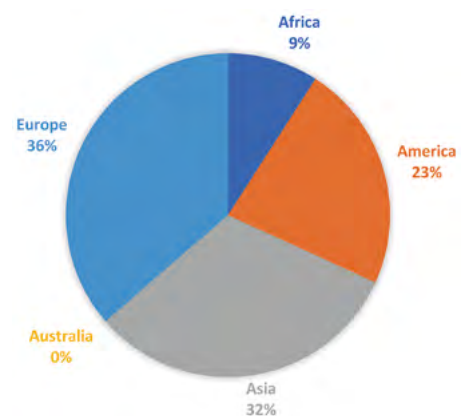


Figure 3. Distribution of Published Papers

As illustrated in Figure 4, digital literacy is the most frequent new literacies in the reviewed articles ($n = 11$). After that, multiliteracies with four appearances in the published articles as the issue of investigation in language teacher's professional development is a common new literacy. Multimodal literacy and computer literacy

have been investigated two times, and other literacies like critical literacy, multiple literacies, CALL literacy, New literacy, and ICT literacy have been explored only once. Some reviewed articles investigated more than one literacies that we categorized them as 'miscellaneous': ICT, computer, and electronic literacies ($n = 1$), digital and multimodal literacies ($n = 1$), multimodal literacy and multiliteracies ($n = 1$), and one article reviewed all of the literacies in one article.

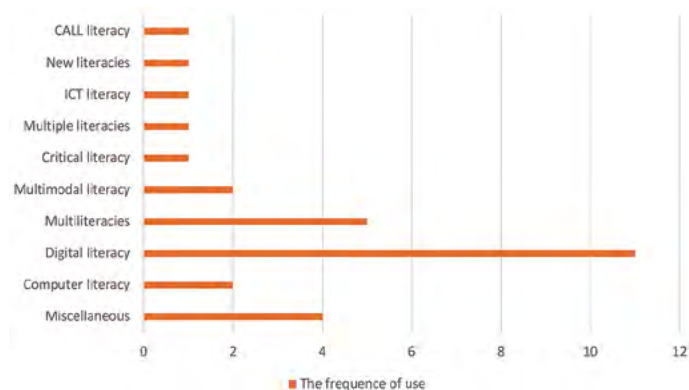


Figure 4. Frequency of New Literacies

Definitions of New Literacies

The way in which the reviewed articles used the definition of new literacies is illustrated in Figure 5. Data analysis shows that the researchers most often do not define the term (66%) and only mention the term in their articles. Also, 14 percent of the scholars define the term primarily with reference to previously published articles and research papers, whereas there is no tendency to refer to policy documents (0%). In addition, only an article develops the concepts further.

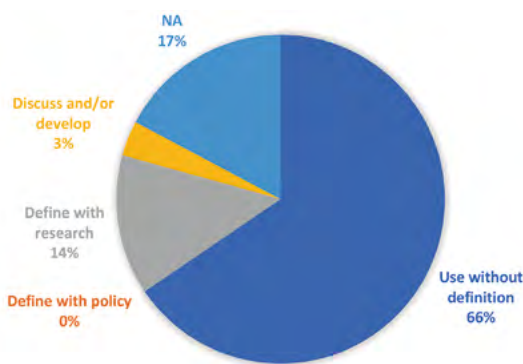


Figure 5. How the Reviewed Articles Used the Definition of New Literacies

Among 29 reviewed articles, only Cruz Arcila (2018) defined multimodal literacy based on Walsh's definition that defined multimodal literacy as "meaning-making that occurs through the reading, viewing, understanding, responding to and producing and interacting with multimedia and digital texts" (Walsh, 2010, p. 213). Also, Dashtestani (2014) was the sole researcher who applied Son and his colleagues' definition for computer literacy: "the ability to use computers at an adequate level for creation, communication and collaboration in a literate society" (Son et al., 2011, p. 27). Interestingly, no scholars defined other new literacies mentioned in their studies (see Figure 5).

Digital literacy, the most frequent new literacy in the reviewed articles (see Figure 4), is a relatively new concept in the field, and three articles defined and adopted it differently. Interestingly, the used definitions applied a more technical, cognitive, and social approach to the concept of digital literacy. Allen (2015) used Eshet-Alkalai and Chajust's (2009) definition of digital literacy with more emphasis on cognitive aspect: "the ability to employ a wide range of cognitive and emotional skills in using digital technology" (p.713). In another way, with more focus on the socio-cultural aspect, Hauck (2019) referred to digital literacy as "the critical and practical understanding of digital technologies in socio-cultural settings, where people are creators as well as observers" (Alexander et al., 2016, p. 1). Ozden (2018) defined digital literacy as "the ability to achieve goals or to retrieve information by using the device with a digital screen and to use the achieved goal and obtained information" (p. 27), which shows a more technical and mechanical approach to the concept. As there is no consensus on the definition of digital literacy and other literacies as well, we believe that different approaches towards one concept, in this case, roots in the nature and aims of the research.

The results of the study concur with Spante et al.'s (2018) systematic review of concept use, digital literacy, and competency in higher education, which mentioned that around 53% of the published papers mentioned without defining digital literacy, 24% referred to research papers for defining the concept, and only 5% of the studies discuss and/or developed the concept. Meanwhile, in Spante et al.'s (2018) study, 24% of the published papers have cited policy documents which are 0% in our reviewed articles. Also, Khalid's (2015) qualitative synthesis showed that digital literacy definitions focused more on the technical and cognitive aspects, and the results did not report the social approach to digital literacy.

Pre-service, In-service Teachers, and Teacher Trainers

Our data analysis shows that 45% ($n = 13$) of reviewed articles focused on in-service teachers, 28% ($n = 8$) on pre-service teachers, 7% ($n = 2$) on pre- and in-service teachers simultaneously, and only one study (3%) focused on teacher trainers. The remaining 17% ($n = 5$) has a more general focus (Figure 6).

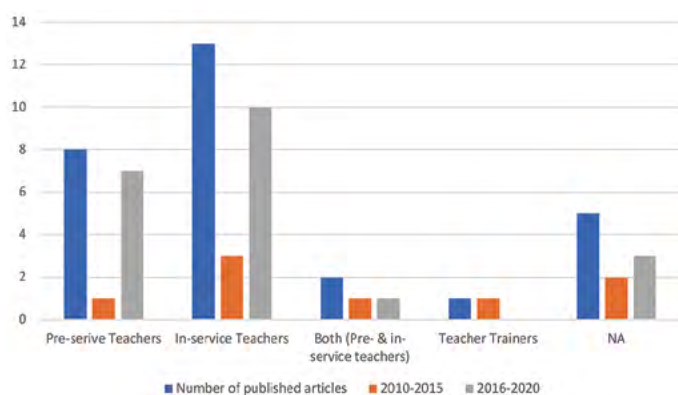


Figure 6. The Focus of Reviewed Papers

In this study, the term in-service teacher refers to a teacher that is already teaching, and a pre-service teacher is a student who is in the process of becoming a teacher. Surprisingly, the results revealed the fact that there is no strong concentration on pre-service teachers in terms of digital literacy development. Based on the focus of the reviewed articles, there is a higher emphasis on in-service teachers.

We believe that there should be more focus on pre-service teachers to understand their challenges, meet their needs, train and educate them, and, finally, to develop their digital literacy for appropriate implications in educational settings in the near future. This does not mean underestimating the significant role of in-service teachers and their needs in improving their digital literacy, but the researchers infer that the priority is with in-service teachers, and scholars in the field already pay attention enough to their roles.

On the one hand, the results in line with Wilhelmsen et al. (2009, as cited in Tømte, 2015) who believed that there is not sufficient focus on 'developing pre-service teachers' digital competence'. On the other hand, this result contrasts with Khalid and his colleagues' (2015) systematic review and meta-analysis on teachers' development of digital literacy who found a strong focus on pre-service teacher's development of digital literacy compared to in-service teachers. Also, it rejects the desirable trend of exploring how pre-service teachers preparing themselves for teaching in a 'technology-saturated environment' (Haugerud, 2011).

Although the literature has signified the critical role of teacher trainers and teachers educators in enlightening pre-service teachers' knowledge on how to use and what to use in their teaching (Agyei & Voogt, 2011; Drent & Meelissen, 2008), our results showed that only one article investigated the role of teacher trainers. Some scholars criticized teacher trainers and educators for their deficiency in training pre-service teachers on how to utilize technologies in their classrooms (Chien et al., 2012), but the findings approved that there is no will among scholars in the field to study the role of teacher trainers. And as the results suggest, the scholars' main focus is on the current teacher, at first, then on prospective teachers.

Research Methods

Concerning the research design, around half of the reviewed studies (48%) were conducted based on the qualitative method (see Figure 7). The researchers applied different tools and techniques for data collection such as critical ethnography, narration, semi-structured and structured interviews, discussion, teaching biographies, field observations, open-ended questionnaires, and document analysis. Nearly one-third of the included studies (26%) used mixed methods based on quantitative and qualitative data results. The results revealed that researchers employed closed- and open-ended questionnaires; interviews and questionnaires; and questionnaire, interview and students' writings to meet the end of their studies. A relatively small portion of included studies (19%) were based on a review, position and/or discussion articles. The least used among the four methods is the quantitative method, with only 7% in which offline and online questionnaires were the dominant tools for data collection.



Figure 7. Research Methods of Reviewed Papers

Recently, the research paradigm and methodology reached diversity, copiousness, and enrichment in the field of language studies and language education through the thoughtful discussions and arguments of several scholars (e.g., Creswell & Plano Clark, 2011; Dörnyei, 2007; Gass, 2015; Mackey et al., 2012; Riazi & Candlin, 2014; Richards et al., 2012; Teddlie & Tashakkori, 2009). Gao et al. (2001) predict the methodological shift from empirical studies to non-empirical ones, qualitative studies, in applied linguistics (also see Lazaraton, 2000, 2002, 2005). In 2009, Richards announced a new shift in research trends from qualitative to mixed methods. He added that "qualitative approaches have been contributing considerably to or developing diverse areas in the L2 field such as communicative language teaching, conversation analysis, linguistic ethnography, and longitudinal studies" (as cited in Ma & Kim, 2014, p. 4). Regarding the research methods, the findings of our study are in line with Albiladi (2019) who systematically reviewed the trends and types of research over a decade in TESOL. Also, he found out that the nature of 45% of the articles in TESOL was qualitative. This result is also approved by another study in 2015 which indicates that qualitative studies play a significant role in TESOL research (Rahman, 2015). However, our findings revealed that quantitative research had obtained a small proportion of research, which is the opposite of Albiladi (2019) findings. He claimed that quantitative research appeared in 30% of published articles in TESOL. In addition, comparing these two studies shows that the mixed methods have almost the same position in Albiladi's (2019) study with 21%. Our findings are opposite to previous studies (e.g., Choe & Ma, 2013; Lazaraton, 2000, Ma & Kim, 2014; Seong & Nam, 2010) in which the quantitative research method was dominant.

Technological Tools and Devices

Unfortunately, in terms of technological tools and devices, many articles ($n = 11$) did not specify the technological tools applied in their studies. However, out of 11 articles, five studies were in the form of review and discussion articles. Surprisingly, seven articles ($n = 7$) were conducted based on several web 2.0 technologies such as interactive web-based tools, virtual exchange telecollaboration tools, e-portfolio, etc. Three authors ($n = 3$) used digital storytelling in their studies; four authors employed mobile phones ($n = 2$) and Learning Management Platform/System ($n = 2$) to reach the aims of their research. The remaining researchers applied digital games, screen-based writing, digital library, and social media in their studies.

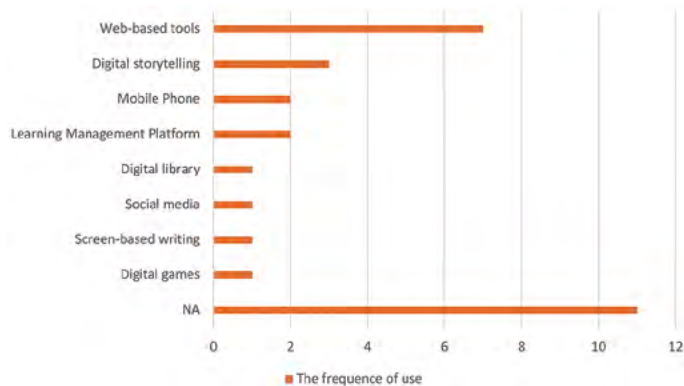


Figure 8. Frequency of Technological Tools and Devices

Web 2.0 technologies include different web-based tools with different capabilities that aim to satisfy their users with enhanc-

ing their creativity, information sharing, and collaboration (Tu et al., 2008). Web 2.0 technologies contain a wide range of tools from social networking and video-sharing sites, wikis, blogs, mashup, telecollaborative tools and folksonomies (Lee, 2019; Wang & Vásquez, 2012). Web 2.0 tools provide more interactive, flexible, and collaborative engagement than Web 1.0 tools, email, chatrooms, among others. A good number of research support the positive effects of Web 2.0 technologies in reading (Ducate & Lomicka, 2008), Speaking (Hsu et al., 2008), writing (Kessler et al., 2012), agency (Lee, 2017), intercultural exchanges (Lee, 2019), academic literacy skills (Sun & Chang, 2012). We argue that due to a variety of tools and plenty of benefits in language education, Web 2.0 technologies become one of the most frequent tools applied in many reviewed studies.

Several scholars confirmed the qualities and advantages of digital storytelling (DST) in language education: developing language skills and competences (Castañeda, 2013; Nami, 2020), (multi)literacy skills (Oskoz & Elola, 2014), and critical thinking (Yang & Wu, 2012) among many other features which make the DST a growing educational tool among language teachers in the last decade. However, the effective integration of DST in language education is meagre. Nami (2020) believed that “this might be attributed to the lack of a consolidated picture regarding the theory and practice of DST in language classrooms” (p. xii), which support the mediocre use of digital storytelling in the reviewed articles.

Despite the general acceptance of the application mobile phones in language education, Mobile-Assisted Language Learning (MALL) (Stockwell, 2010, 2012), the infrequent use of mobile phones in the reviewed studies might be due to challenges in using mobile phones in language learning and teaching such as lack of objective, quantifiable learning outcomes (Heil et al., 2016), and inadequate research design (Burston, 2015). This could be the same situation for the Learning Management Platform (LMP) and Learning Management System (LMS) as tools for boosting cooperation and interaction among students in language education settings. Using Virtual Learning Environments (VLEs) like LMP/S is an attempt to extend the concept of educational settings (Denton, 2012) which leads to experiencing more interactions through various communicative devices (Liu & Kleinsasser, 2015). Notwithstanding the mentioned benefits, many scholars pointed out some negative facets of VLEs: cultural sensitivity, and time constraint (Dayag, 2018). Pros and cons of other technology-based tools in language education, also, appeared in a plethora of studies around the world: digital games (Hung et al., 2018; Swier & Peterson, 2018; Yang et al., 2018), screen-based writing (Aytan, 2017; Dowdall, 2018; Tuzel, 2013), and social media (Reinhardt, 2019; Zheng et al., 2018).

Conclusion

In this study, we investigated the themes and topics addressed language teachers' new literacies in the published articles between 2010–2020 to understand research and approaches to the new literacies of language teachers. In other words, we conducted an integrative review to analyze published journal articles that define or discuss the concepts of new literacies in relation to teachers' professional development and education. The analyzed studies also indicate that digital literacy in the most frequent term. Most of the published papers are from Asia and Europe and were conducted on in-service teachers. In fact, only one study (i.e., Dashtestani, 2014) was conducted on teacher trainers. A great majority of these papers also relied on qualitative research design, and web 2.0 technologies are the dominant technologies in the reviewed studies. The review demonstrates further that concepts are used,

in many cases, without definitions, which on one side indicates the spread of the concepts and on the other the discrepancy in the ways researchers refer to the concept (Spante, et al. 2018). We found the continuous growth in the number of published papers which focused on the concept of new literacies in language teacher's professional development and we expect more publication in the coming years; especially due to the COVID-19 pandemic and the transition of education to fully online courses during 2020 and perhaps 2021.

As implications of this study, we tried to provide a landscape on the concepts of new literacies in language teacher's professional development and education. Our findings might pave the way for future researchers to recognize and classify new possible areas of research as regards the use of new literacies as a necessity for language pedagogy. They may find it interesting to study underexplored areas of teacher's new literacies such as teacher's attitudes and perceptions, teacher's cognitive, psychological, social, and cultural backgrounds, assessment and testing, language teaching techniques and strategies, and so on. Another implication of the study would be introducing initial information for the development of a clear theoretical framework on language teacher's digital literacy. This framework would be useful in explaining the eligibility of a language teacher in the 21st century.

Although our study provided some interesting implications and insights, a number of limitations should be noted as well. The first limitation is the academic databases used in retrieving published articles. Future studies may use other and further academic sources to achieve a better view. Second, future studies may scrutinize all the publications such as books, book chapters, thesis/dissertations, conference proceedings and papers. Third, we only studied published articles in English language. By adding non-English articles for analysis, a more comprehensive view of new literacies in language teacher's professional development may be achieved. Finally, because language teaching and technology use vary from country to country, and in some countries the use of technology in public schools has some limitations, future studies may investigate the policy-based approach to new literacies which would help both researchers and decision-makers to accept the relevance, suitability, and potentiality of new literacies in a specific context. This study should be considered as a pioneering effort to systematically synthesize the included published articles, rather than a narrative review. It is significant in providing a scoping analysis of the research methods employed, new literacies adopted and defined, target languages studied, and teachers' status involved in the existing new literacies literature in teacher's professional development area.

References

- References marked with an asterisk indicate studies included in this review.
- Agyei, D. D., & Voogt, J. (2011). ICT use in the teaching of mathematics: Implications for professional development of pre-service teachers in Ghana. *Education and Information Technologies*, 16, 423–439. <https://doi.org/10.1007/s10639-010-9141-9>
- Akayoglu, S., Satar, H. M., Dikilitas, K., Cirit, N. C., & Korkmazgil, S. (2020). Digital literacy practices of Turkish pre-service EFL teachers. *Australasian Journal of Educational Technology*, 36(1), 85–97. <https://doi.org/10.14742/ajet.4711>
- *Albers, P., Turnbull, S., Angay-Crowder, T., Cho, A., Shin, J. H., Pace, C., . . . Jung, J. K. (2015). Questions of matter: Critical conversations in online spaces. *Journal of Adolescent & Adult Literacy*, 59(2), 171–181. <https://doi.org/10.1002/jaal.446>

- Albiladi, W. (2019). *Research in TESOL: An investigation of trends and types of research over the last ten years*. Preprints. <https://www.preprints.org/manuscript/201911.0380/v1>
- Alexander, B., Adams Becker, S., & Cummins, M. (2016) *Digital Literacy: An NMC Horizon Project Strategic Brief*. Vol. 3.3, October 2016. New Media Consortium.
- *Allen, C. (2015). Marriages of convenience? Teachers and coursebooks in the digital age. *ELT Journal*, 69(3), 249-263. <https://doi.org/10.1093/elt/ccv005>
- Allen, C., & Berggren, J. (2016). Digital literacy and sustainability – a field study in EFL teacher development. In S. Papadima-Sophocleous, L. Bradley & S. Thouëсны (Eds.), *CALL communities and culture – short papers from EUROCALL 2016* (pp.14-19). Research-publishing.net.
- Almás, A. G., & Krumsvik, R. (2007). Digitally literate teachers in leading edge schools in Norway. *Journal of In-Service Education*, 33(4), 479-497. <https://doi.org/10.1080/13674580701687864>
- *Anderson, J., Chung, Y.-C., & Macleroy, V. (2018). Creative and critical approaches to language learning and digital technology: findings from a multilingual digital storytelling project. *Language and Education*, 32(3), 195-211. <https://doi.org/10.1080/09500782.2018.1430151>
- Aşık, A., Köse, S., Ekşi, G. Y., Seferoğlu, G., Pereira, R., & Ekiert, M. (2020). ICT integration in English language teacher education: insights from Turkey, Portugal and Poland. *Computer Assisted Language Learning*, 33(7), 708-731. <https://doi.org/10.1080/09588221.2019.1588744>
- Aytan, T. (2017). Evaluation of electronic writing experiences of Turkish teacher candidates at WATTPAD environment. *Higher Education Studies*, 7(4), 1-8. <http://doi.org/10.5539/hes.v7n4p1>
- Benitt, N., Schmidt, T., & Legutke, M. K. (2019). Teacher learning and technology-enhanced teacher education. In X. Gao (Ed.), *Second handbook of English language teaching* (pp. 1171-1193). Springer. https://doi.org/10.1007/978-3-030-02899-2_58
- Birks, M., & Mills, J. (2011). *Grounded theory: A practical guide*. SAGE.
- Burston, J. (2015). Twenty years of MALL project implementation: A meta-analysis of learning outcomes. *ReCALL*, 27(1), 4-20. <https://doi.org/10.1017/S0958344014000159>
- Cardoso, S. (2017). New technologies, multiple literacies and teaching English as a foreign language. *e-TEALS: An e-journal of Teacher Education and Applied Language Studies*, 8, 1-26.
- Castañeda, M. (2013). "I am proud that I did it and it's a piece of me": Digital storytelling in the foreign language classroom. *CALICO Journal*, 30(1), 44-62. <https://doi.org/10.1558/cj.30.1.44-62>
- Chien, Y.-T., Chang, C.-Y., Yeh, T.-K., & Chang, K.-E. (2012). Engaging pre-service science teachers to act as active designers of technology integration: A MAGDAIRE framework. *Teaching & Teacher Education*, 28(4), 578-588. <https://doi.org/10.1016/j.tate.2011.12.005>
- Choe, M. H., & Ma, J. H. (2013). A comparison of current research topics and methods between domestic and international journals in SLA. *English Teaching* 68(2), 79-103.
- *Chun, D., Kern, R., & Smith, B. (2016). Technology in language use, language teaching, and language learning. *The Modern Language Journal*, 100(S1), 64-80. <https://doi.org/10.1111/modl.12302>
- Cooper, H. (1998). *Synthesizing research: A guide for literature review* (3rd ed.). SAGE.
- Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). SAGE.
- *Cruz Arcila, F. (2018). The wisdom of teachers' personal theories: Creative ELT practices from Colombian rural schools. *Profile: Issues in Teachers' Professional Development*, 20(2), 65-78. <https://doi.org/10.15446/profile.v20n2.67142>
- *Dagenais, D., Toohey, K., Fox, A. B., & Singh, A. (2017). Multilingual and multimodal composition at school: ScribJab in action. *Language and Education*, 31(3), 263-282. <https://doi.org/10.1080/09500782.2016.1261893>
- *Dashtestani, R. (2013). Implementing mobile-assisted language learning (MALL) in an EFL context: Iranian EFL teachers' perspectives on challenges and affordances. *The JALT CALL Journal*, 9(2), 149-168. <https://doi.org/10.29140/jaltcall.v9n2.153>
- *Dashtestani, R. (2014). Exploring English as a foreign language (EFL) teacher trainers' perspectives on challenges to promoting computer literacy of EFL teachers. *The JALT CALL Journal*, 10(2), 139-151. <https://doi.org/10.29140/jaltcall.v10n2.172>
- Dayag, J. D. (2018). EFL virtual learning environments: Perception, concerns and challenges. *Teaching English with Technology*, 18(4), 20-33.
- Denton, D. W. (2012). Enhancing instruction through constructivism, cooperative learning, and cloud computing. *TechTrends*, 56, 34-41. <https://doi.org/10.1007/s11528-012-0585-1>
- *Dooly, M. (2015). It takes research to build a community: Ongoing challenges for scholars in digitally-supported communicative language teaching. *CALICO Journal*, 32(1), 172-194. <https://dx.doi.org/10.1558/calico.v32i1.25664>
- Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford University Press.
- Dowdall, C. (2018). Young children's writing in the 21st century: The challenge of moving from paper to screen. In O. Erstad, R. Flewitt, B. Kümmerling-Meibauer & I. S. Pires Pereira (Eds.), *The Routledge handbook of digital literacy in early childhood* (pp. 257-269). Routledge.
- Drent, M., & Meelissen, M. (2008). Which factors obstruct or stimulate teacher educators to use ICT innovatively? *Computers & Education*, 51(1), 187-199. <https://doi.org/10.1016/j.compedu.2007.05.001>
- Ducate, L., & Lomicka, L. (2008). Adventures in the blogosphere: From blog readers to blog writers. *Computer Assisted Language Learning*, 21(1), 9-28. <https://doi.org/10.1080/09588220701865474>
- Dudenev, G., Hockly, N., & Pegrum, M. (2013). *Digital literacies*. Pearson Education.
- Erben, T. (1999). Constructing learning in a virtual immersion bath: LOTE teacher education through audiographics. In R. Debski & M. Levy (Eds.), *WORLDCALL: Global perspectives on computer-assisted language learning* (pp. 229-248). Swets & Zeitlinger.
- Eshet-Alkalai, Y. (2004). Digital literacy: A conceptual framework for survival skills in the digital era. *Journal of Educational Multimedia and Hypermedia*, 13(1), 93-106.
- Eshet-Alkalai, Y., & Chajut, E. (2009). Changes over time in digital literacy. *CyberPsychology & Behavior*, 12(6), 713-715. <https://doi.org/10.1089/cpb.2008.0264>
- Gao, Y., Li, L., & Lu, J. (2001). Trends in research methods in applied linguistics: China and the west. *English for Specific Purposes*, 20(1), 1-14. [https://doi.org/10.1016/S0889-4906\(99\)00015-0](https://doi.org/10.1016/S0889-4906(99)00015-0)
- Gass, S. (2015). Methodologies of second language acquisition. In M. Bigelow & J. Enns-Kananen (Eds.), *The Routledge handbook of educational linguistics* (pp. 9-22). Routledge/Taylor & Francis.
- Gee, J. (1992). *The social mind: Language, ideology, and social practice*. Bergin and Garvey.

- *Hauck, M. (2019). Virtual exchange for (critical) digital literacy skills development. *European Journal of Language Policy*, 11(2), 187-209. <https://doi.org/10.3828/ejlp.2019.12>
- Haugerud, T. (2011). Student teachers learning to teach: The mastery and appropriation of digital technology. *Nordic Journal of Digital Literacy*, 6(04), 226-238.
- Heil, C. R., Wu, J. S., Lee, J. J., Schmidt, T. (2016). A review of mobile language learning applications: Trends, challenges, and opportunities. *The EuroCALL Review*, 24(2), 32-50. <https://doi.org/10.4995/eurocall.2016.6402>
- *Hockly, N. (2012). Digital literacies. *ELT Journal*, 66(1), 108-112. <https://doi.org/10.1093/elt/ccr077>
- Hsu, H., Wang, S., & Comac, L. (2008). Using audioblogs to assist English-language learning: An investigation into student perception. *Computer Assisted Language Learning*, 21(2), 181-198. <https://doi.org/10.1080/09588220801943775>
- Hung, H-T., Yang, J. C., Hwang, G-J., Chu, H-C., & Wang, C-C. (2018). A scoping review of research on digital game-based language learning. *Computers & Education*, 126, 89-104. <https://doi.org/10.1007/s11423-019-09702-2>
- Ilomäki, L., Paavola, S., Lakkala, M., & Kantosalo, A. (2016). Digital competence – an emergent boundary concept for policy and educational research. *Education and Information Technology*, 21, 655-679. <https://doi.org/10.1007/s10639-014-9346-4>
- *Jamalvandi, B., Sadeghi, H., & Soleimani, H. (2017). Computer Assisted Language Learning and EFL Teachers' Literacy: A Case in Iran. *International Journal of English Linguistics*, 7(1), 201-214. <https://doi.org/10.5539/ijel.v7n1p201>
- *Jeong, K.-O. (2017). Preparing EFL student teachers with new technologies in the Korean context. *Computer Assisted Language Learning*, 30(6), 488-509. <https://doi.org/10.1080/09588221.2017.1321554>
- *Jiang, L., Yu, S., & Zhao, Y. (2019). Teacher engagement with digital multimodal composing in a Chinese tertiary EFL curriculum. *Language Teaching Research*, 1-20. <https://doi.org/10.1177%2F1362168819864975>
- *Kazemi, A., & Narafshan, M. H. (2014). Technology and English Language Teaching (ELT). *Advances in Language and Literary Studies*, 5(6), 60-67. <http://dx.doi.org/10.7575/aiac.all.v.5n.6p.60>
- Kellner, D. (2002). Technological revolution, multiple literacies, and the restructuring of education. In I. Snyder (Ed.), *Silicon literacies* (pp. 154-169). Routledge.
- Kessler, G., Bikowski, D., & Boggs, J. (2012). Collaborative writing among second language learners in academic Web-based projects. *Language Learning & Technology*, 16, 91-109. <http://dx.doi.org/10.125/44276>
- Khalid, M. S., Slættalíð, T., Parveen, M., & Hossain, M. S. (2015). A systematic review and meta-analysis of teachers' development of digital literacy. In E. K. Sorensen, A. Szucs, & M. S. Khalid (Eds.), *Proceedings of the 1th D4 Learning international Conference Innovations in Digital Learning for Inclusion (D4Learning, 2015)* (pp. 136-144). Aalborg Universitetsforlag.
- *Knobel, M., & Lankshear, C. (2019). Language teachers researching and understanding new literacies and language-in-use from a social languages perspective. *The European Journal of Applied Linguistics and TEFL*, 8(2), 159-174.
- *Krulatz, A., & Neokleous, G. (2018). Fostering literacy in adolescent EFL classrooms: An overview of techniques and teaching ideas. *The European Journal of Applied Linguistics and TEFL*, 7(1), 57-71.
- Lankshear, C., Gee, J. P., Knobel, M., & Searle, C. (1997). *Changing literacies*. Open University Press.
- Lazaraton, A. (2000). Current trends in research methodology and statistics in applied linguistics. *TESOL Quarterly*, 34(1), 175-181. <https://doi.org/10.2307/3588103>
- Lazaraton, A. (2002). Quantitative and qualitative approaches to discourse analysis. *Annual Review of Applied Linguistics*, 22, 32-51. <https://doi.org/10.1017/S0267190502000028>
- Lazaraton, A. (2005). Quantitative research methods. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (pp. 209-224). Lawrence Erlbaum.
- Lee, L. (2017). Learners' perceptions of the effectiveness of blogging for L2 writing in fully online language courses. *International Journal of Computer-Assisted Language Learning and Teaching*, 7, 19-33. <https://doi.org/10.4018/IJCALLT.2017010102>
- Lee, L. (2019). Using telecollaboration 2.0 to build intercultural communicative competence: A Spanish-American exchange. In: D. Tafazoli, M. E. Gomez Parra & C. A. Huertas Abril (Eds.), *Cross-cultural perspectives on technology-enhanced language learning* (pp. 303-321). IGI Global.
- Liu, M. H., & Kleinsasser, R. C. (2015). Exploring EFL teachers' CALL knowledge and competencies: In-service program perspectives. *Language Learning & Technology*, 19, 119-138. <http://dx.doi.org/10.125/44405>
- Liu, Q., & Chao, C. (2018). CALL from an ecological perspective: How a teacher perceives affordance and fosters learner agency in a technology-mediated language classroom. *ReCALL*, 30(1), 68-87. <https://doi.org/10.1017/S0958344017000222>
- Ma, J. H., & Kim, Y. (2014). Current research trends of English education in domestic and international journals. *Foreign Language Education Research*, 17, 1-13.
- Mackey, A., Abbuhl, R., & Gass, S. M. (2012). Interactionist approaches. In S. Gass & A. Mackey (Eds.), *The Routledge handbook of second language acquisition* (pp. 7-23). Routledge/Taylor & Francis.
- Manca, S., & Ranieri, M. (2016). Is Facebook still a suitable technology-enhanced learning environment? An update critical review of the literature from 2012 to 2015. *Journal of Computer Assisted Learning*, 32, 503-528. <https://doi.org/10.1111/jcal.12154>
- Nami, F. (2020) (Ed.). *Digital storytelling in second and foreign language teaching*. Peter Lang.
- Nazari, M., & Xodabande, I. (2020). L2 teachers' mobile-related beliefs and practices: contributions of a professional development initiative. *Computer Assisted Language Learning*. <https://doi.org/10.1080/09588221.2020.1799825>
- New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66(1), 60-92. <https://doi.org/10.17763/haer.66.1.17370n67v22j160u>
- *Norton, B., & Early, M. (2011). Researcher identity, narrative inquiry, and language teaching research. *TESOL Quarterly*, 45(3), 415-439. <https://doi.org/10.5054/tq.2011.261161>
- *Oskoz, A., & Elola, I. (2016). Digital stories: Overview. *CALICO Journal*, 33(2), 157-173. <https://dx.doi.org/10.1558/cj.v33i2.29295>
- Oskoz, A., & Elola, I. (2014). Integrating digital stories in the writing class: Towards a 21st century literacy. In J. P. Guikema & L. Williams (Eds.), *Digital literacies in foreign and second language education: Research, perspectives, and best practices* (pp. 179-200). CALICO.
- *Ozden, M. (2018). Digital literacy perceptions of the students in the Department of Computer Technologies teaching and Turkish language teaching. *International Journal of Progressive Education*, 14(4), 26-36. <https://doi.org/10.29329/ijpe.2018.154.3>
- *Paneru, D. R. (2018). Information communication technologies in teaching English as a foreign language: Analysing EFL teachers' TPACK in Czech elementary schools. *Center for*

- Educational Policy Studies Journal*, 8(3), 141-163. <https://doi.org/10.26529/cepsj.499>
- Rahman, M. S. (2015). The contribution made by qualitative research to TESOL. *International Journal of English Language Teaching*, 3(2), 1-14.
- Reinhardt, J. (2019). Social media in second and foreign language teaching and learning: Blogs, wikis, and social networking. *Language Teaching*, 52(1), 1-39. <https://doi.org/10.1017/S0261444818000356>
- Riazi, A. M., & Candlin, C. N. (2014). Mixed-methods research in language teaching and learning: Opportunities, issues and challenges. *Language Teaching*, 47, 135-173. <https://doi.org/10.1017/S0261444813000505>
- Richards, K. (2009). Trends in qualitative research in language teaching since 2000. *Language Teaching*, 42(2), 147-180. <https://doi.org/10.1017/S0261444808005612>
- Richards, K., Ross, S., & Seedhouse, P. (2012). *Research methods for applied language studies*. Routledge/Taylor & Francis.
- *Rwodzi, C., de Jager, L., & Mpfu, N. (2020). The innovative use of social media for teaching English as a second language. *Td-the Journal for Transdisciplinary Research in Southern Africa*, 16(1), 1-7. <https://doi.org/10.4102/td.v16i1.702>
- *Ryu, J., & Boggs, G. (2016). Teachers' perceptions about teaching multimodal composition: The case study of Korean English teachers at secondary schools. *English Language Teaching*, 9(6), 52-60. <https://doi.org/10.5539/elt.v9n6p52>
- Salaberry, M. R. (2000). Pedagogical design of computer mediated communication tasks: Learning objectives and technological capabilities. *The Modern Language Journal*, 84(1), 28-37. <https://doi.org/10.1111/0026-7902.00050>
- Seong, M. H., & Nam, E. H. (2010). An analysis of article trends published in the journal of Modern English Education over the past 10 years. *Modern English Education*, 11(2), 1-19.
- Seppälä, P., & Alamäki, H. (2003). Mobile learning in teacher training. *Journal of Computer Assisted Learning*, 19(3), 330-335. <https://doi.org/10.1046/j.0266-4909.2003.00034.x>
- *Soler, I. G., & Tecedor, M. (2018). Foreign language teaching assistant training: A contrastive analysis of trainers and trainees' perspectives. *Hispania*, 101(1), 38-54. <https://doi.org/10.1353/hpn.2018.0083>
- Son, J.-B. (2018). *Teacher development in technology-enhanced language teaching*. Palgrave Macmillan.
- Son, J.-B., Robb, T., & Charismiadji, I. (2011). Computer literacy and competency: A survey of Indonesian teachers of English as a foreign language. *CALL-EJ*, 12(1), 26-42.
- Snyder, I. (Ed.). (1997). *Page to screen: Taking literacy into the electronic era*. Routledge.
- Snyder, I., & Beavis, C. (Eds.). (2004). *Doing literacy online: Teaching, learning and playing in an electronic world*. Hampton Press.
- Spante, M., Hashemi, S. S., Lundin, M., & Algiers, A. (2018). Digital competence and digital literacy in higher education research: Systematic review of concept use. *Cogent Education*, 5(1), 1-21. <https://doi.org/10.1080/2331186X.2018.1519143>
- Stockwell, G. (2010). Using mobile phones for vocabulary activities: Examining the effect of the platform. *Language Learning & Technology*, 14(2), 95-110. <http://dx.doi.org/10.125/44216>
- Stockwell, G. (2012). Working with constraints in mobile learning – A response to Ballance. *Language Learning & Technology*, 16(3), 24-31. <http://dx.doi.org/10.125/44294>
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. SAGE.
- Sun, Y. C., & Chang, Y. J. (2012). Blogging to learn: Becoming EFL academic writers through collaborative dialogues. *Language Learning & Technology*, 16(1), 43-61. <http://dx.doi.org/10.125/44274>
- Swier, R., & Peterson, M. (2018). 3D digital games, virtual worlds, and language learning in higher education: continuing challenges in Japan. *The JALT CALL Journal*, 14(3), 225-238. <https://doi.org/10.29140/jaltcall.v14n3.232>
- Sykes, J. M. (2018). Digital games and language teaching and learning. *Foreign Language Annals*, 51(1), 219-224. <https://doi.org/10.1111/flan.12325>
- Tafazoli, D., Gómez Parra, M. E., & Huertas Abril, C. A. (2017). Computer literacy: Sine qua non for digital age of language learning & teaching. *Theory and Practice in Language Studies*, 7(9), 716-722. <http://dx.doi.org/10.17507/tpls.0709.02>
- Tafazoli, D., Gómez Parra, M. E., & Huertas Abril, C. A. (2019). Attitude towards computer-assisted language learning: Do age, gender, and educational level matter? *Teaching English with Technology*, 19(3), 22-39.
- Tan, S., O'Halloran, K., & Wignell, P. (2016). Multimodal research: Addressing the complexity of multimodal environments and the challenges for CALL. *ReCALL*, 28(3), 253-273. <https://doi.org/10.1017/S0958344016000124>
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. SAGE.
- *Tok, M. (2015). Examining pre-service teacher views on the implementation of screen-based writing instruction. *International Electronic Journal of Elementary Education*, 7(2), 235-252.
- Tømte, C. E. (2015). Educating teachers for the new millennium? Teacher training, ICT and digital competence. *Nordic Journal of Digital Literacy*, 10(Special issue 2006-2016), 138-154.
- Tuzel, S. (2013). Integrating multimodal literacy instruction into Turkish language teacher education: An action research study. *Anthropologist*, 16(3), 619-630. <https://doi.org/10.1080/09720073.2013.11891387>
- Ulmer, G. L. (2003). *Internet invention: From literacy to electracry*. Longman.
- Van Gorp, K., Giupponi, L., Heidrich Uebel, E., Dursun, A., & Swinehart, N. (2019). Defining teachers' readiness for online language teaching: Toward a unified framework. In F. Meunier, J. Van de Vuver, L. Bradley, & S. Thousény (Eds.), *CALL and complexity – short papers from EUROCALL 2019* (pp. 373-378). Research-publishing.net.
- Walsh, M. (2010). Multimodal literacy: What does it mean for classroom practice? *Australian Journal of Language and Literacy*, 33(3), 211-239.
- Waldman, T., Harel, E., & Schwab, G. (2019). Extended telecollaboration practice in teacher education: Towards pluricultural and plurilingual proficiency. *European Journal of Language Policy*, 11(2), 167-185. <https://doi.org/10.3828/ejlp.2019.11>
- Warner, C., & Dupuy, B. (2018). Moving toward multiliteracies in foreign language teaching: Past and present perspectives ... and beyond. *Foreign Language Annals*, 51, 116-128. <https://doi.org/10.1111/flan.12316>
- Wang, S., & Vásquez, C. (2012). Web 2.0 and second language learning: What does the research tell us? *CALICO Journal*, 29(3), 412-430. <https://dx.doi.org/10.11139/cj.29.3.412-430>
- Warschauer, M. (1999). *Electronic literacies: Language, culture, and power in online education*. Lawrence Erlbaum.
- *Xerri, D., & Campbell, C. (2016). E-portfolios in teacher development: The better option? *ELT Journal*, 70(4), 392-400. <https://doi.org/10.1093/elt/ccw032>
- Xue, S., & Churchill, D. (2020). Educational affordances of mobile social media for language teaching and learning: A Chinese

- teacher's perspective. *Computer Assisted Language Learning*. <https://doi.org/10.1080/09588221.2020.1765811>
- Yang, J. C., Lin, M. Y. D., Chen, S. Y. (2018). Effects of anxiety levels on learning performance and gaming performance in digital game-based learning. *Journal of Computer Assisted Learning*, 34(3), 324-334. <https://doi.org/10.1111/jcal.12245>
- Yang, Y., & Wu. W. (2012). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & Education*, 59, 339-352. <http://dx.doi.org/10.1016/j.compedu.2011.12.012>
- Yanguas, Í. (2018). Technology in the Spanish heritage language classroom: Can computer-assisted language learning help? *Hispania*, 101(2), 224-236. <http://doi.org/10.1353/hpn.2018.0115>
- *Yi, Y., & Angay-Crowder, T. (2016). Multimodal pedagogies for teacher education in TESOL. *TESOL Quarterly*, 50(4), 988-998. <https://doi.org/10.1002/tesq.326>
- *Zacchi, V. J. (2018). Literacies and digital gaming: Negotiating meanings in English language teacher education. *Revista Tempos E Espacos Educacao*, 11(1), 153-168. <https://doi.org/10.20952/revtee.v11i01.9831>
- Zheng, B., Yim, S., & Warschauer, M. (2018). Social media in the writing classroom and beyond. In D. D. Belcher & A. Hirvela (Eds.), *The TESOL encyclopedia of English language teaching* (pp. 1-5). John Wiley & Sons.

