Technologies in Second Language Formative Assessment: A Systematic Review

Skevi Vassiliou, Salomi Papadima-Sophocleous & Christina Nicole Giannikas

The present article considers the types of technologies used in second language formative assessment (L2FA) by producing an integrative Systematic Review (SR) of articles, books and chapters published from the year 2000 to 2020. It is informed by methodology procedures followed in other SRs. The study follows a qualitative descriptive research approach. The analysis reveals the significance of digital tools in L2FA practices, the various technologies used in L2FA, their use in different language aspects, as well as the input and the extent they have in L2FA. The aim of the paper is first to highlight the impact of the use of technologies in L2FA application, then to identify the main trends and issues that are related to the use of technologies in L2FA, and finally to shed light on the current research conducted on the matter.

Key words: Second Language, Formative Assessment, Technologies, Computer Assisted Language Assessment, Systematic Review

1. Introduction

This integrative Systematic Review (SR) of articles, books and chapters published from 2000 to 2020 focuses on the types of technologies used in Second Language Formative Assessment (L2FA). According to the literature, online FA applications have been mostly applied and studied by researchers in the area of mathematics and science (Fuller & Dawson, 2017; Mitten Jacobbe, & Jacobbe, 2017). Nonetheless, a number of researchers have begun to pay attention to the use of technology-facilitated FA in second or foreign language teaching (Kiliçkaya, 2017; Kent, 2019). The aim of the present paper is first to highlight the impact of the use of technologies in L2FA application, then to identify the main trends and issues that are related to the use of technologies in L2FA, and finally to shed light on the current research conducted on the matter.

Technology, in both language teaching and language assessment, can be traced back to the 1960s (Chappelle & Voss, 2016). The history of Computer-Assisted Language Assessment or Computer-Assisted Language Testing (CALT) follows the history of language assessment, which is mostly about online language testing. This involves the development of Computer-Based Tests (CBTs) and Computer Adaptive Tests (CATs). Since the expansion of the personal computer in the late seventies and early eighties (Godwin-Jones, 2001), there have been many computer programmes developed

for L2 electronic testing. Mechanisms built into Web courses management systems such as WebCT, Blackboard, and Moodle facilitate testing over the Internet (Goldwin-Jones, 2001). Testing programmes developed by institutions or instructors to tailor particular needs such as IELTS, TOEFL, QPT, GCSE, Nepton (New English Placement Test Online) (Papadima-Sophocleous & Alexander, 2007; Papadima-Sophocleous, 2007, 2008, 2012) also exist in both pen-and-paper and /or in electronic form. It is, therefore, evident that from early scoring devices to the latest Computer Adaptive Tests and other Internet based assessment mechanisms, computers have come to play a major role in language testing. It is also evident that there has been a dominant focus in the area of testing and examination in Second Language (L2) Learning (Vassiliou, 2019, p. 7); Since 2000 however, many researchers dedicated their work on Second Language Learning Formative Assessment (FA) (Black & William, 2009; Black & William, 2018; Rea-Dickins & Gardner, 2000; Tan, 2013; Tsagari & Michaeloudes, 2013; Vogt & Tsagari, 2014).

Formative assessment focuses on the process of learning, involves student, peer and instructor involvement and aims to monitor learning and learning processes in order to improve them. As a result, alternative computer-based assessment formats started being used, not just for testing, which is mostly a summative form of assessment, but also for formative assessment purposes. E-assessment tools, like online quizzes, can be used for FA purposes and can provide comprehensive and on-time, instant and effective feedback to students, and can monitor their understanding (Baleni, 2015). According to the literature, such e-tools include Turnitin, Grademark, Electronic Feedback Software, Questionmark Perception, WebCTConnect, MarkTool, Markin, Moodle Quiz, Markers Assistant (Heinrich, Milne & Moore, 2009), and Google Docs where teachers and students can discuss and exchange ideas synchronously on a shared document (Reimann, Halb, Bull & Johnson, 2011). Research also dealt with the importance of gamified quizzes and online tools like Socrative, Kahoot, Eclipse, Quizlet, Edmodo, Padlet, Storify, and Google Forms, Remind 101, as FA tools in language learning, which can be used during the learning process, and give instant feedback to students (Vassiliou, 2019, p. 24); in order to modify and improve their curriculum design, content, and their student's learning experiences and learning (Heinrich et al., 2009; Reimann et al., 2011).

Other e-applications, such as the Online Peer Feedback (OPE) application, e-journals, e-reflective journals, e-portfolios, e-rubrics, e-can-do lists, Google Forms and e-artifacts can also be used for FA purposes (Vassiliou, 2019, pp. 21-22); These can offer opportunities to students for self and peer feedback (Rosalia & Llosa, 2009; Papadima-Sophocleous, 2017). Responses from such tools assist teachers in their planning of subsequent lessons according to students' understanding. Technology enables both the teacher and the learner to reach their L2 expected outcomes with the use of different tools (Perera-Diltz & Moe, 2014). Technology-enhanced FA can improve students' progress and can accommodate an assessment environment, an integral part of the learning environment, that promotes authentication, real-life settings and critical thinking for students.

Preliminary research revealed that, although some types of literature review papers have been written about the use of technologies in second language formative assessment (L2FA), there is no systematic review (SR) as yet to identify, select, synthesise primary researcher studies, and give a comprehensive overview of the research conducted so far (Oakley, 2012). The present SR paper addresses this gap as it investigates the types of technologies used in L2FA explored in the reviewed studies and their impact in L2FA from 2000 to 2020.

The aim of the present article is first to highlight the impact of the use of technologies in L2FA application, then to identify the main trends and issues that are related to the use of technologies in L2FA, and finally to shed light on the current research conducted on the matter. The study comes to fill the gap that exists by giving a comprehensive overview of the research in language L2FA activities with the use of technologies in the last 20 years.

In order to conduct the SR of studies focussing on technology-enhanced L2 FA, the following research questions were identified:

1. What types of technologies were used for L2FA purposes?
2. What was the language focus formatively assessed with the use of technologies?
3. What languages, educational levels, and participants were involved in the studies?
4. What were the research purposes and outcomes?
5. What was the geographic distribution of L2 FA studies?
6. What suggestions were made by authors for further research in the area?

2. Method, analysis framework and coding

2.1. Method

The qualitative descriptive methodology used was informed by other SRs as in Crompton, Burke, and Lin (2018). A coding procedure was applied to collect and analyse data (see Saldaña, 2015). The themes were defined by the research questions and based on inclusion and exclusion criteria. A search was conducted in databases and Web search engines like, EBSCOhost, ERIC, ResearchGate, Google Scholar. The study selection and the search strings were based on the ones used in Vassiliou's master dissertation (2019). The study selection consisted of applying search strings from the above bibliographical databases described. The search strings were chosen as they are the ones mostly used regarding the use of technologies in L2 FA:

a) (Formative Assessment) AND (Second Language Teaching) OR (Second Language Learning) AND technologies OR CALL OR technology enhanced
b) (Classroom Assessment) AND (Second Language Teaching) OR (Second Language Learning) AND technologies OR CALL OR technology enhanced
c) (Alternative Assessment) AND (Second Language Teaching) OR (Second Language Learning) AND technologies OR CALL OR technology enhanced
d) Portfolio Assessment AND (Second Language Teaching) OR (Second Language Learning) AND technologies OR CALL OR technology enhanced

The following inclusion/exclusion criteria were used:

a) Inclusion:
1. published between 2000-2020;
2. reviewed journal articles, or conference proceedings papers, short papers, book chapters, books, handbooks, PhD or Master theses, or reports;
3. reported technology-supported L2FA practices;
4. presented such practices in primary, secondary or tertiary context;
5. presented quantitative, qualitative or mixed research approaches.

b) Exclusion:
1. not published between 2000-2020;
2. hosted in web pages freely accessed through university accounts where only abstracts were available;
3. composed of only one page (abstract papers), posters, and tutorial slides;
4. duplicated publications by the same author (similar title, abstract, results, or text). In such a case, only one is included in this review;
5. written in languages other than English.

The initial search process and the use of inclusion/exclusion criteria was based on the ones used in Vassiliou (2019): The initial search resulted in the identification of a total number of 15,787 research publications. The inclusion/exclusion criteria process which followed took this number down. The exclusion criterion 1, eliminated 9,200 publications since they were not published in the chronological period 2000-2020; thus, 6,587 publications remained. From criterion 2, 2,531 were removed since they dealt with FA generically and not related to L2FA and technologies. The exclusion criterion 3 eliminated 2,458 publications since they were not freely accessed and only abstracts could be accessed by the researcher (Vassiliou, 2019, p. 31).

The remaining 1.598 studies were further evaluated to ensure that they fulfilled the other inclusion/exclusion criteria. Moreover, 1,050 studies were also removed according to exclusion criterion 4, since they were composed of only one page. The exclusion criterion 5 eliminated another 336 publications since they were duplicated. Moreover, according to criterion 6, 178 publications were removed since they were written in languages other than English (Vassiliou, 2019, pp. 31-32). The search process and the final number of publications selected and included in the present SR can be seen in Figure 1.
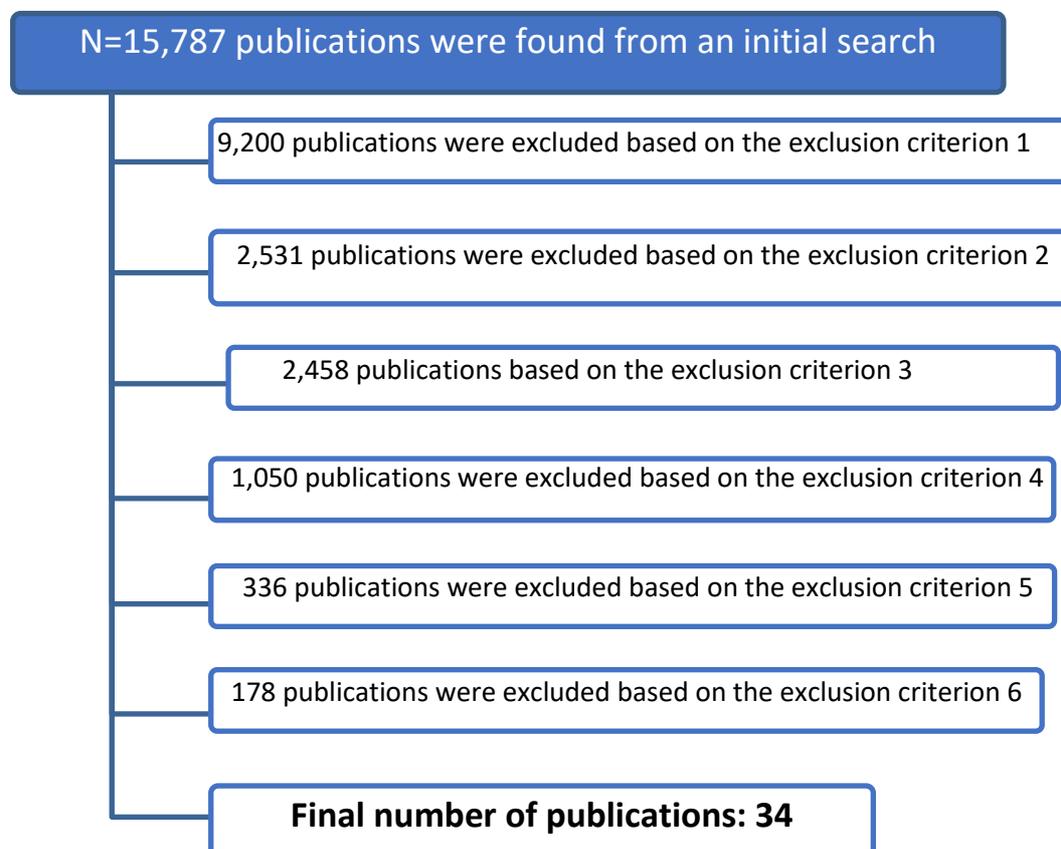

Figure 1. The final number of publications included in the Systematic Review

2.2. Analysis framework and coding

The tentative research questions identified framed a combination of predetermined and emerging codes (Creswell, 2009, p. 187), which emerged from themes used in earlier similar SRs (Crompton et al, 2017; Spolaôr and Benitti, 2017). The main categories identified and coded were the following: types of technologies, language focus formatively assessed with the use of technologies, participants,

educational level, purpose and outcomes, the geographic distribution of the use of technologies LL FA studies, and what suggestions made by authors for further research in the area.

3. Results and Discussion

3.1. Types of technologies used in L2FA

The review revealed that a variety of technologies are being used in L2FA (see Figure 2). This indicates that technologies are considered as useful by L2FA practitioners and researchers. The popularity of technologies indicated in Figure 2 does not come as a surprise as they are 'assessment friendly' and can be applied to different student levels. According to the information on Figure 2, 22% of the studies focused on the use of E-portfolio in L2FA practices. They are consistent with earlier research findings: Cummins & Davesne, (2009) mention the significant benefits of using an E-portfolio rather than a paper and pencil-based portfolio; some of them are interactivity, wide storage of media files, cooperative learning and artefacts (Vassiliou, 2019, p. 67). In their study "Assessing pre-service English language teachers' learning using E-portfolios: Benefits, challenges and competencies gained", Kabilan & Khan (2012) state that E-portfolio can be considered as an important formative tool that provides peer feedback and stimulates students' creativity (Vassiliou, 2019, p. 75). One of the biggest advantages of implementing an E-portfolio discussed in the literature is drafting, editing, and revising (Babaee, & Tikoduadua, 2013).
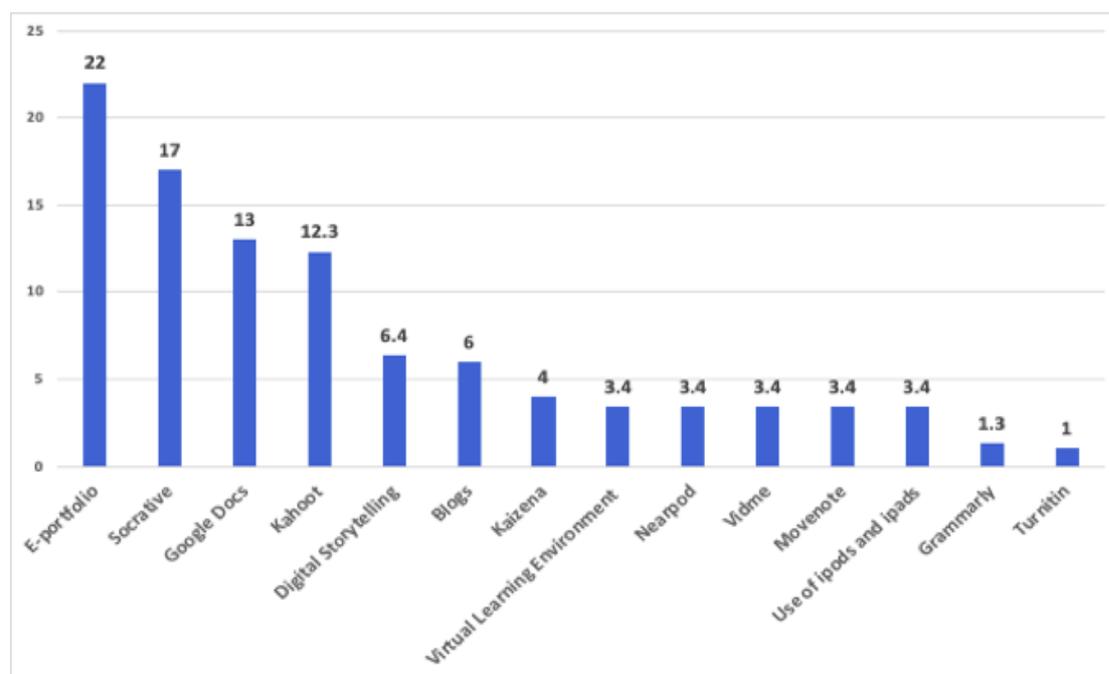

Figure 2: Types of technologies used for L2FA purposes

As indicated in Figure 2, other technology tools were also used for FA purposes. E-portfolios were followed by Socrative application with 17%, Google Docs with 13%, Kahoot with 12.3%, Digital Storytelling with 6.4 %, Blogs with 6%, Kaizena with 4%, Nearpod with 3.4%, Vidme 3.4%, Movenote with 3.4%, iPods and iPads with 3.4 % Virtual Learning Environment with 3.4%, Grammarly with 1.3 % and Turnitin with 1%.

Overall, researchers reported the use of fifteen different types of technologies. This indicates that technologies are considered as useful by L2FA practitioners and researchers. This provides useful information to the scholarly community. The popularity of technologies indicated in Figure 2 does not come as a surprise as they are 'assessment friendly' and can be applied in different student levels. However, the results indicate that the percentages of use of technologies in general, and of each type of technology in particular are still quite low. All stakeholders should be encouraged to further explore the use of technologies in L2FA and make the most of their affordances. As Pellerin (2012) has stated, digital tools can improve students' performance and can enable teachers to integrate better tools to serve L2FA purposes (Vassiliou, 2019, p. 49); It is reported that learners benefit from receiving computer formative feedback and their speaking and writing skills improve (Radford, 2014).

3.2. Language focus formatively assessed with the use of technologies

As displayed in Figure 3, 68% of the reviewed publications focused on traditional aspects such as language skills: writing 41%, reading 6%, speaking 6%, and listening 15 %. Others dealt with other traditional aspects such as Grammar and Vocabulary. The results indicate that language assessment tends to mainly focus on writing skills. All these publications also followed the traditional pattern of assessing language skills separately.
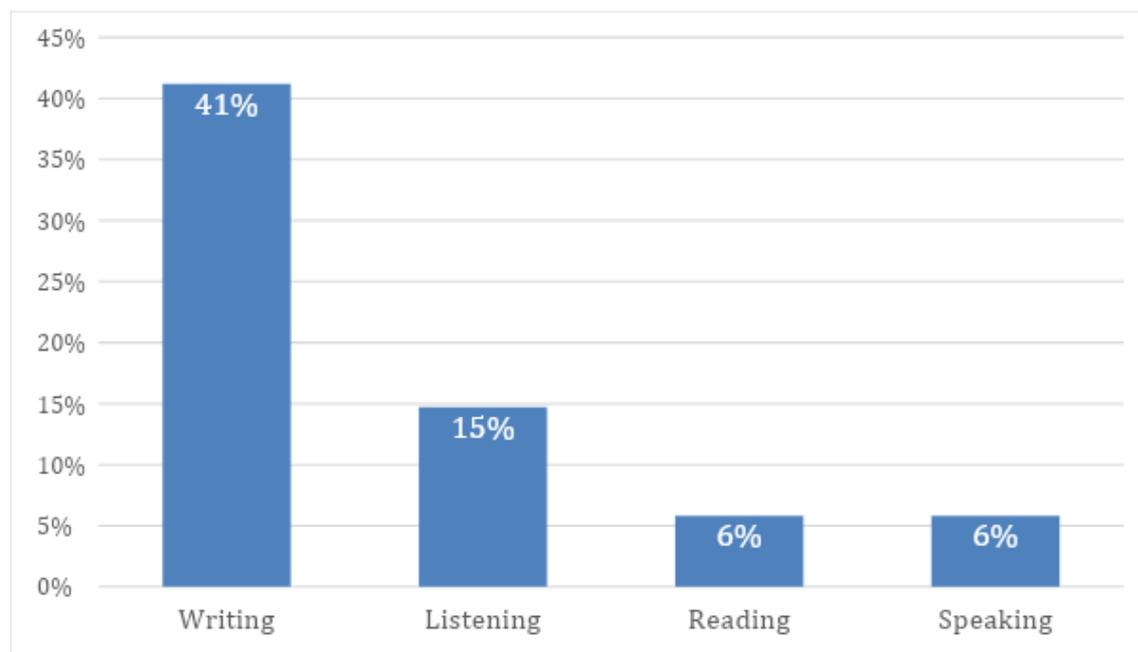

Figure 3. Language focus distribution

3.3. Languages, educational levels, participants involved in the studies and geographic distribution of the use of technologies in LL FA studies

3.3.1. Languages
English (56%) was the most surveyed language in the L2FA retained studies. It is surprising that Italian (6%) and Greek (3%) – rather than more commonly surveyed languages such as German and Spanish are among the languages assessed by technologies. If the review was extended to publications in other

languages, the results are anticipated to be different. This may be an area of future investigation.
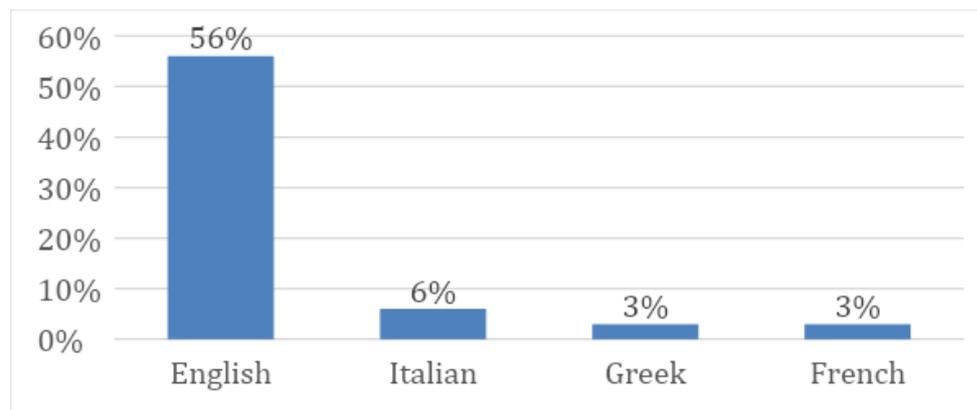

Figure 4: Languages

3.3.2. Educational levels

Findings show 74% of the reviewed publications mentioned the educational level of the technology-supported L2FA practices. The data revealed that tertiary settings were the most frequent (59%), over primary (9%) and secondary (6%).

3.3.3. Participants

Similarly, 74% mentioned the type of participants, the rest chose not to. The data also revealed that most studies involved students as participants (59%). 12% investigated teachers and 3% involved both students and teachers. More research would shed light into the use of technologies in L2FA at primary and secondary level and to other stakeholders such as teachers, examiners, school administrators, etc.

3.3.4. Geographic distribution of the use of technologies in LL FA studies

The SR reveals that studies were conducted in all continents except Antarctica. A total number of 18 countries were represented in this SR for the use of technologies in L2FA implementations. From Figure 6 it is evident that the US has the highest percentage 17% of studies, followed by Australia with 11%, Spain 7%, Japan 7%, Greece, Chile, China, Cyprus, Norway respectively with 6%, Turkey and Iran with 5% each, Saudi Arabia and Hong Kong with 4%, Canada and Israel with 3%, Taiwan, Malaysia and New Zealand with 2% respectively. Although research takes place worldwide, the percentages are still low.
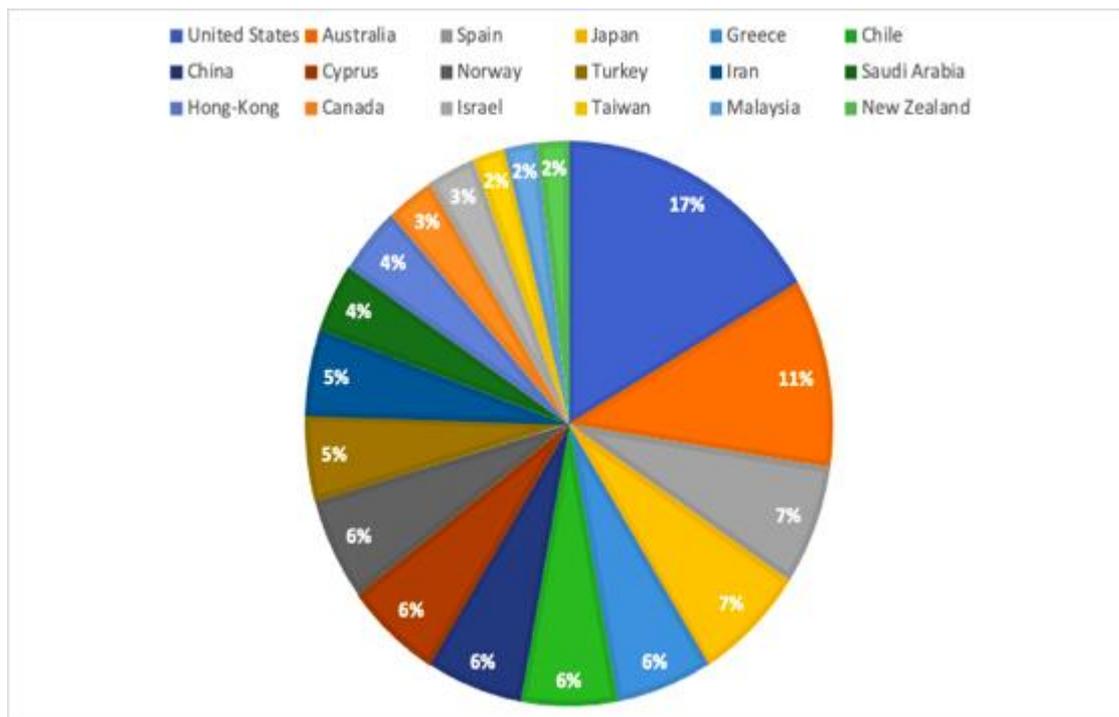
Figure 5. Geographic distribution of technology-enhanced L2FA studies

3.4. Research purposes and outcomes

3.4.1. Research purposes

Only 82% of the reviewed publications have mentioned their research purpose; the majority of these studies looked at online feedback (35%) and the use of digital tools (31%). This indicates the need for further examination of the purposes and focus of research in the use of technologies in language formative assessment. 97% of the research studies reviewed examined the advantages of the use of technologies for L2FA purposes. The remainder 3% were reviews which discussed the role of technology for L2FA purposes. More specifically 29% of the studies aimed to display the effects of online feedback in L2FA context. Feedback was reported in papers as "automated feedback" "corrective feedback", "online feedback", "peer feedback", "audio feedback" (Cotos, 2010; Sevilla-Pavón, et al., 2011; Heritage & Chang, 2012; Levy, & Gertler, 2015; Seyyedrezaie, Ghansoli, Shahriari, & Fatemi, 2016; Bless, 2017; Ranalli, Link, & Chukharev-Hudilainen, 2017).

According to Cotos (2010) online automated feedback has a strong positive impact on improving students' writing skills. Also, a clear and effective feedback of what has to be changed through the use of technologies in L2FA context is really beneficial for students. Seyyedrezaie, Ghansoli, Shahriari, & Fatemi (2016) support that explicit corrective feedback through the use of Google Docs increases students' confidence in their writing performance and offers opportunities for peer feedback. Additionally, Williamson and Sadera (2016) state that students who received electronic feedback had better results in summative assessment tasks through Grammarly and Turnitin Quickmark and improved their writing skills. Bless (2017) presented in his study the use of digital audio feedback through Kaizena that offers opportunities to improve students' writing skills. Canals and Robbins (2017) introduced a Virtual Learning Environment (VLE) where effective feedback was provided to improve students' oral and written skills.

Furthermore, Lee (2017), Saglam (2018), Ranalli et al. (2017), Alzaid & Alkarzae (2019), Alharbi, & Meccawy (2020), Kapsalis, Galani & Tzafea (2020) aimed to investigate if the use of various online

tools, like Storytelling, Blog-based writing, Wikis, Automated Writing Evaluation (AWE), Kahoot, Socrative, Nearpod, Google Docs, Screencast feedback can be used in L2FA practices and increase students' motivation and engagement for learning. The integration of technology gives more opportunities to students and learners to achieve a task than paper-based L2FA (Alzaid & Alkarzae, 2019). Alharbi and Meccawy (2020) showed the potential of Socrative as a L2FA online tool. Many of the advantages of Socrative are instant feedback, answer explanations and automated total score display. Also, researchers aimed to examine if Kahoot, an online tool that can be used for FA purposes, and in doing so, can improve language learning (Kapsalis et al., 2020). Also, Yarahmadzehi and Goodarzi (2020) investigated if there is any significant difference between the vocabulary gain of Iranian pre-intermediate EFL learners assessed formatively by paper and pen and those assessed formatively using a mobile device.

Eighteen percent of studies explore the benefits of using the E-portfolios as L2FA tools. More specifically, Kabilan and Khan (2012) aimed to investigate if E-portfolio can be considered as an effective formative assessment tool more than traditional-based tests. Also, Hung (2012) investigated the washback effects of implementing an E-portfolio. Additionally, Babaee and Tikoduadua (2013) explored the benefits of using an E-portfolio in improving students' writing skills. They concluded that the use of E-portfolios increased students' self-regulation, reflection and autonomy.

Other studies (8%) aimed to investigate teachers' perceptions on using technologies for L2FA purposes. Researchers aimed to investigate if a technology-accommodated environment offers an opportunity to formatively assess their students (Bless, 2017; Davison, 2019; Yarahmadzehi & Goodarzi, 2020).
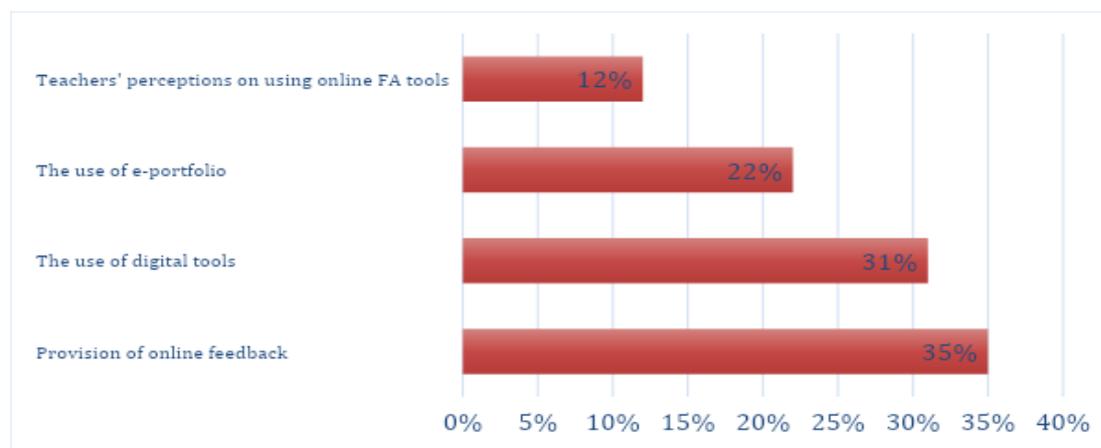

Figure 6. Research Purposes

In general, most of the research has been conducted to explore the affordances and the benefits of using digital technologies for FA purposes in Second Language Learning. Many of them aimed to investigate the improvement of students' language skills and some other teachers' perceptions on using digital tools for L2FA purposes.

3.4.2. Research outcomes

A total of 97% reported a positive impact of a technology-enhanced environment for L2FA practices on students' motivation and progress. Some authors highlighted the fact that an integrated technology environment may increase peer work (Hung, 2012; Babaee, & Tikoduadua, 2013; Cotter., & Hinkelman, 2019). Babaee and Tikoduadua (2013) argued that social networks and E-portfolios can promote peer assessment and self-assessment. Also, Cummins and Davesne (2009) stated that the

use of an E-portfolio offers students more opportunities for interaction and cooperative learning. Additionally, teachers in another study found E-portfolios more effective as an assessment tool in comparison to traditional tests. The integration of E-portfolio was found as an important formative tool that provides peer feedback and stimulates students' creativity, self-regulation, reflection and autonomy (Kabilan, & Khan, 2012; Babaee, & Tikoduadua, 2013).

Some other studies illustrated the improvement of students' writing skills with the use of automated or instant feedback (Tang, Rich, & Wang, 2012). Also, students became more autonomous, motivated and confident in their writing with the use of the automated assessment tool Writing Roadmap WRM (Tang et al., 2012). Moreover, Google Docs writing instructions increased students' confidence in their writing performance (Seyyedrezaie, et al., 2016). The findings of this systematic review came to agree with the findings of Bless (2017) who reported that audio feedback for formative assessment was not time consuming compared to writing feedback, and it created better relations with the students (Bless, 2017). The accommodation of a technology-enhanced environment for L2FA purposes may improve students' listening skills according to Caruso, Gadd Colombi, & Tebbit (2017). The study results indicated that the students enjoyed the flexibility offered by the environment and the effectiveness of the quizzes in developing their listening skills. Also, Alzaid, and Alkarzae (2019) concluded that web-based assessments offer more opportunities for FA than paper-based and improves the level of learner's memory. However, some issues concerning the integration of a technology-enhanced environment for FA purposes such as internet connectivity and learners' resistance to the use of technology during the lesson were reported (Hung, 2012; Kabilan, & Khan, 2012).

It is worth mentioning that teachers in some studies did not have a clear idea of the purpose of using FA; according to the authors, this could be explained by the fact that many teachers focused more on summative assessment practices and language educators need training in L2FA practices (Heritage, & Chang, 2012; Vassiliou & Papadima-Sophocleous, 2019).

3.5. Suggestions made by authors for further research in the area

Some researchers stated that a technology-enhanced environment can support L2FA practises. For this reason, language educators should be encouraged to further explore the integration of digital tools (Demirci, & Düzenli, 2017; Saglam, 2018). One aspect that could be further explored could be the role of gamification in L2FA, thus expanding what has already been addressed by Alzaid, & Alkarzae (2019). It was also suggested that more research should be conducted on L2 assessment and more specifically on FA practices (Papadima-Sophocleous, 2017). Also, Pellerin (2012) suggested that further research in the area should be conducted in the hope that language teachers realise that digital technologies offer many opportunities for language learning and FA implementations (Vassiliou, 2019, p. 76). Other researchers have suggested the need to train teachers to understand the importance of assessing learners for FA purposes. It was also suggested that it would be important to train students on how to use online self and peer assessment (Cotter, Hinkelman, 2019; Vassiliou, & Papadima-Sophocleous, 2019).

3.6. Limitations and identified gaps

This systematic review is an overview of the research published on the use of technologies in L2FA between 2000 and 2020. During this review, some limitations were experienced. One was the difficulty in accessing all the papers found during the research. Although 15,787 papers were found, 2,531 papers would not be accessed. One of the reasons was that some authors delayed giving access to their papers or payment was required for some others. Taking into consideration that of the 15,854

reviewed publications only 34 met the inclusion/exclusion criteria, one can suggest a similar result with the 2,816 publications which were not accessible. Their inclusion in this SR may have given different findings. They may have also given further and more informed and inclusive future directions to the researchers, practitioners and language teachers. It should be noted, however, this does not mean that all these 2,531 publications would have met the criteria.

 Another limitation may be considered the fact that this study reviewed only research published in English. There may be papers published in other languages with important research outcomes related to L2FA. This could be a further research endeavour.

4. Conclusions

The data revealed that a variety of technologies have broadly been used in L2FA. Although theory, practice and research cover other L2 areas beyond language skills, the review indicated that research still focuses on language skills. Other aspects such as mediation and multilingualism could be explored. The data revealed that most publications examined the use of technologies at tertiary level, involving mostly students as participants. More research is needed at primary and secondary level and examining other participants such as examiners, and other stakeholders. The review also revealed that most research was carried out in the US and Australia, followed by Spain and Japan and less in other countries. More research would give a more comprehensive and accurate view of what is happening worldwide. Most research focused on feedback and the use of digital tools. Research in the use of technologies in other L2FA aspects would be useful. Finally, a positive impact of technology-enhanced L2FA practices on students' motivation and progress was reported in most publications.

References

Alharbi, A. S., & Meccawy, Z. (2020). Introducing Socrative as a Tool for Formative Assessment in Saudi EFL Classrooms. *Arab World English Journal, 11*(3), 372-384.

Alzaid, F., & Alkarzae, N. (2019). The Effects of Paper, Web, and Game Based Formative Assessment on Motivation and Learning: A Literature Review.
https://files.eric.ed.gov/fulltext/ED594189.pdf

Babaee, M., & Tikoduadua, M. (2013). E-portfolios: A new trend in formative writing assessment. *International Journal of Modern Education Forum (IJMEF), 2*(2), 49-56.

Baleni, Z.G. (2015). Online Formative Assessment in Higher Education: Its Pros and Cons. *Electronic Journal of e-Learning, 13*, 228-236.

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. Educational Assessment, *Evaluation and Accountability, 21*(1), 5-31. https://doi.org/10.1007/s11092-008-9068-5

Black, P., & Wiliam, D. (2018). Classroom assessment and pedagogy. *Assessment in education: Principles, policy & practice*, *25*(6), 551-575.

Caruso, M., Gadd Colombi, A., & Tebbit, S. (2017). Teaching how to Listen. Blended Learning for the Development and Assessment of Listening Skills in a Second Language. *Journal of University Teaching & Learning Practice, 14*(1), 14. https://files.eric.ed.gov/fulltext/EJ1142367.pdf

Chapelle, C. A., & Voss, E. (2016). 20 years of technology and language assessment in Language Learning & Technology. *Language Learning & Technology, 20(*2), 116–128.

Cotos, E. (2010). *Automated writing evaluation for non-native speaker English academic writing: The case of IADE and its formative feedback* (Unpublished PhD dissertation). Iowa State University, Ames Iowa, USA.

Cotter, M., & Hinkelman, D. (2019). Video assessment module: self, peer, and teacher post performance assessment for learning. In F. Meunier, J. Van de Vyver, L. Bradley & S. Thou sny (Eds), *CALL and complexity – short papers from EUROCALL 2019* (pp. 94-99). Research-publishing.net. https://doi.org/10.14705/rpnet.2019.38.992

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

Crompton, H., Burke, D., & Lin, Y. C. (2018). Mobile learning and student cognition: A systematic review of PK-12 research using Bloom's Taxonomy. *British Journal of Educational Technology, 50*(2), 684-701. https://doi.org/10.1111/bjet.12674

Cummins, P. W., & Davesne, C. (2009). Using electronic portfolios for second language assessment. *The Modern Language Journal, 93*(1), 848-867. https://doi.org/10.1111/j.1540-4781.2009.00977.x

Demirci, C., & Düzenli, H. (2017). Formative Value of an Active Learning Strategy: Technology Based Think-Pair-Share in an EFL Writing Classroom. *World Journal of Education, 7*(6), 63-74.

Godwin-Jones, R. (2001). Language testing tools and technologies. *Language Learning & Technology*, *5*(2), 8-12.

Fuller, J. S., & Dawson, K. M. (2017). Student response systems for formative assessment: Literature-based strategies and findings from a middle school implementation. *Contemporary Educational Technology*, *8*(4), 370-389.

Heinrich, E., Milne, J., & Moore, M. (2009). An investigation into e-tool use for formative assignment assessment–status and recommendations. *Journal of Educational Technology & Society*, *12*(4), 176-192.

Heritage, S., & Chang, S. (2012). Teacher use of formative assessment data for English language learners. *National Center for Research on Evaluation, Standards, & Student Testing,* 1- 11. Retrieved from https://www.cse.ucla.edu/products/states_schools/ELL_Symposium_FINAL.pdf

Hung, S. T. A. (2012). A washback study on e-portfolio assessment in an English as a Foreign Language teacher preparation program. *Computer Assisted Language Learning, 25*(1), 21-36. https://doi.org/10.1080/09588221.2010.551756

Kabilan, M. K., & Khan, M. A. (2012). Assessing pre-service English language teachers' learning using e-portfolios: Benefits, challenges and competencies gained. *Computers & Education, 58(*4), 1007-1020. https://doi.org/10.1016/j.compedu.2011.11.011

Kapsalis, G. D., Galani, A., & Tzafea, O. (2020). Kahoot! As a Formative Assessment Tool in Foreign Language Learning: A Case Study in Greek as an L2. *Theory and Practice in Language Studies, 10*(11), 1343-1350.

Kent, D. (2019). Plickers and the pedagogical practicality of fast formative assessment. *Teaching English with Technology, 19*(3), 90-104.

Kilickaya, F. (2017). Improving formative assessment in language classrooms using. GradeCam Go! *Teaching English with Technology, 17*(4), 78-92.

Lee, I. (2017). Technology in classroom L2 writing assessment and feedback. I*n Classroom Writing Assessment and Feedback in L2 School Contexts* (pp. 123-146). Singapore: Springer. http://doi-org-443.webvpn.fjmu.edu.cn/10.1007/978-981-10-3924-9_9

Mitten, C., Jacobbe, T., & Jacobbe, E. (2017). What do they understand? Using technology to facilitate formative assessment. *Australian Primary Mathematics Classroom, 22*(1), 9-12.

Oakley, A. (2012). Foreword. In D. Gough, S. Oliver, & J. Thomas (Eds.), An introduction to systematic reviews (pp. viiex). London: SAGE Publications.

Papadima-Sophocleous, S., & Alexander, C. (2007a). The NEPTON test: System Overview and Functionality' *Teaching English with Technology 7*(2), 1-14. http://www.tewtjournal.org/pastissues2007.htm http://www.iatefl.org.pl/call/j_article28.htm

Papadima-Sophocleous, S. (2007b). New English Placement Test Online (NEPTON): combining theories with application realities. *CLESOL 2006 Proceedings Origins and*

Connections: Linking Theory, Research and Practice. Aotearoa, New Zealand. CD publication. No pages.

Papadima-Sophocleous, S. (2008). A hybrid of a CBT-and a CAT-based New

English Placement Test Online (NEPTON) INTRODUCTION' *CALICO Journal*, *25*(2), 276-304.

Papadima-Sophocleous, S. (2012). New English Placement Test Online (NEPTON): A

Blueprint. In D. Tsagari, (Ed.).,*Research on EFL in Cyprus,* V. II) (pp. 105-135). Nicosia: University of Nicosia Press.

Papadima-Sophocleous, S. (2017). L2 assessment and testing' teacher education: an exploration of alternative assessment approaches using new technologies. *CALL in a climate of change: adapting to turbulent global conditions*, 248.

Pellerin, M. (2012). Digital documentation: Using digital technologies to promote language assessment for the 21st century. OLBI *Working Papers,* *4.* https://doi.org/10.18192/olbiwp.v4i0.1105

Perera-Diltz, D., & Moe, J. (2014). Formative and summative assessment in

online education. *Journal of Research in Innovative Teaching, 7*(1), 130-142. Retrieved from https://digitalcommons.odu.edu/chs_pubs/37/

Radford, B. W. (2014). *The Effect of Formative Assessments on LanguagePerformance* (Doctoral dissertation). Brigham Young, Provo. http://scholarsarchive.byu.edu/etd/3978

Ranalli, J., Link, S., & Chukharev-Hudilainen, E. (2017). Automated writing evaluation for formative assessment of second language writing: Investigating the accuracy and usefulness of feedback as part of argument-based validation. *Educational Psychology*, *37*(1), 8-25.

Rea-Dickins, P., & Gardner, S. (2000). Snares and silver bullets: Disentangling the construct of formative assessment. *Language Testing*, *17*(2), 215-243.

Reimann, P., Halb, W., Bull, S., & Johnson, M. (2011, September). Design of a computer-assisted assessment system for classroom formative assessment. In *2011 14th International Conference on Interactive Collaborative Learning* (pp. 465-472). IEEE.

Rosalia, C., & Llosa, L. (2009). Assessing the quality of online peer feedback in L2 writing. *Handbook of research on e-learning methodologies for language acquisition* (pp. 322-338). IGI Global.

Saglam, A. L. (2018). The Integration of Educational Technology for Classroom-Based Formative Assessment to Empower Teaching and Learning. In A. Khan, & S. Umair (Eds.), *Handbook of Research on Mobile Devices and Smart Gadgets in K-12 Education* (pp. 321-341). IGI Global. https://doi.org/10.4018/978-1-5225-2706-0.ch020

Saldaña, J. (2021). *The coding manual for qualitative researchers*. Sage.

Sevilla-Pavón, A., Martínez-Sáez, A., & de Siqueira, J. M. (2011). Self-assessment and tutor assessment in online language learning materials: InGenio FCE Online Course and Tester. *Second language teaching and learning with technology: views of emergent researchers*, 45.

Seyyedrezaie, Z. S., Ghonsooly, B., Shahriari, H., & Fatemi, A. H. (2016). Examining the effects of Google Docs-based instruction and peer feedback types (implicit vs. explicit) on EFL learners' writing performance. *Call-EJ*, *17*.

Spolaôr, N., & Benitti, F. B. V. (2017). Robotics applications grounded in learning theories on tertiary education: A systematic review. *Computers & Education*, *112*, 97-107.

Tan, K. (2013). A Framework for Assessment for Learning: Implications for Feedback Practices within and beyond the Gap. *International Scholarly Research Notices*, *2013*.

Tang, J., Rich, C. S., & Wang, Y. (2012). Technology-enhanced English language writing assessment in the classroom. *Chinese Journal of Applied Linguistics, 35*(4), 385-399. Retrieved from http://www.celea.org.cn/teic/102/1.pdf

Tsagari, D., & Michaeloudes, G. (2013). Formative Assessment Patterns in CLIL Primary Schools in Cyprus. In S. Ioannou-Georgiou, S. Papadima-Sophocleous, & D. Tsagari, (Eds.), *International Experiences in Language Testing and Assessment*, 28, (pp. 75-93). Peter Lang Edition.

Vassiliou, S. (2019). *Formative Assessment in second Language Learning: A Systematic review and an Annotated Bibliography* [Master's Thesis, Cyprus University of Technology]. https://ktisis.cut.ac.cy/handle/10488/22825

Vassiliou, S., & Papadima-Sophocleous, S. (2019). A Systematic Review and Annotated Bibliography of Second Language Learning Formative Assessment: An Overview. In *Conference Proceedings. Innovation in Language Learning 2019*.

Skevi Vassiliou (paraskevi.vassiliou@cut.ac.cy) is a Special Scientist-Greek Language Instructor at Language Centre of Cyprus University of Technology. She holds a BA in Greek Language and Literature (Aristotle University of Thessaloniki, an MA in Education (Saint Louis U.S), an MA in Computer Assisted Language Learning (Cyprus University of Technology) and she is a PhD candidate in Education-Curriculum and Instruction (Saint Louis U.S). Her research interests include Language Assessment Literacy, Formative Assessment in L2 teaching and learning, technology implementations for Formative Assessment Second Language Learning purposes and teaching methodologies in Second Language teaching and learning.

Salomi Papadima-Sophocleous (salomi.papadima@cut.ac.cy) holds a doctorate in Applied Linguistics (English Online Testing). She retired in May 2021 (Language Centre Director, MA in Computer Assisted Language Learning: CALL coordinator, and Computer Assisted Language Assessment & Testing lecturer, Cyprus University of Technology: CUT) and is currently a researcher at Cyprus Computer Lab, CUT. Her research interests include Computer Assisted Language Learning, Curriculum Development and Assessment. She has recently co-authored *Formative assessment in second language learning: a systematic review and an annotated bibliography* (2022).

Christina Nicole Giannikas (christina.giannikas@cut.ac.cy)
Christina Nicole Giannikas holds a PhD in the field of Applied Linguistics. She is a consultant and founder of CG Education & Research Consultancy. She also works in Higher Education where she lectures courses in Applied Linguistics, is a teacher trainer for pre-service and in-service programs in Cyprus and beyond, and is a researcher for the Department of Rehabilitation Sciences at Cyprus University of Technology. She specialises in early language learning, age-appropriate digital pedagogies, digital literacies, assessment, and Teacher Education.