Chapter 1
Contextualizing and Adapting Teacher Education and Professional Development

Philip Hubbard

Abstract In the past two decades, the influence of computer-assisted language learning (CALL) in language teaching has significantly expanded. In parallel with this trend, the preparation and professional development of teachers in the domain of CALL knowledge and skills have similarly grown. As with so many other areas of language teaching, this growth has been most visible in mainstream literature centered on settings in the US, the UK, and a few other developed countries. In line with the theme of this book, I provide a foundation for shifting that focus toward the teaching and learning contexts of the broader world, the under-represented contexts, to support the adaptation and creation of locally appropriate teacher education and professional development initiatives. I begin with a brief review of the history of teacher training in CALL, focusing on useful concepts and frameworks. I then introduce the TESOL Technology Standards for Teachers (TTST) as a target for language teachers (TESOL, 2008; Healey et al., 2011). Importantly, the TTST were designed from the onset to be relevant internationally and flexible enough to be applied to low, mid, and high-technology resource environments. I will argue that by using the TTST as a guide, teacher educators can localize them to align with the curricular goals, teaching realities, and technologies available to teachers and their students. I conclude with an example of how I adapted one aspect of the TTST to fit the specific context of my own CALL course. Overall, the goal is to set the stage for readers of the rest of this volume to find inspiration there in the voices of pre-service and in-service teachers, teacher educators, and researchers that resonate with their own contexts and experiences.

Keywords Teacher education · Standards · Professional development · CALL · TESOL Technology Standards

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1 Introduction

Teacher education in using technology for language learning is not a recent phenomenon. In 1982, I arrived at Ohio University to begin what would be a 4-year experience teaching in the Linguistics Department and the Ohio Program of Intensive English. I was surprised to discover that a professor there, Marmo Soemarmo, was already offering a graduate-level three-course sequence which he referred to as computational linguistics for research and teaching, incorporating much of what others were beginning to call computer-assisted language learning (CALL). These classes focused heavily on programming skills for teacher candidates as there was little in the way of commercial software available at that time. Inspired by that idea, and with some mentoring from Soemarmo, I began my own journey into the CALL world, leveraging programming skills from a 1980 computer science class I had taken in the last term of my linguistics PhD program. I programmed reading and vocabulary exercises in BASIC for my ESL students in the intensive English program using an Apple II computer.

I did not realize until later how lucky I had been to be at Ohio University at just that time. There were not many other institutions where a dedicated technology course for language teachers was offered, although some training was beginning to become available. Curtin and Shinall (1985), for example, offered a rationale and guidelines for a two-week computer-assisted instruction (CAI) workshop for high school and university foreign language teachers they conducted. However, beyond these relatively rare settings, there was little in the way of systematic technology education available to language teachers that actually focused on teaching languages. Writing about the 1980s, Chapelle (2006) noted that the best many teacher training programs could do then was to "…advise interested students to take a general educational technology course. Twenty years ago, this was a tenable solution, but language teachers today need to be able to choose, use, and in some cases refuse technology for their students" (p. vii).

Despite such offerings continuing to be sporadic, in the 1990s, whole degree programs devoted to the field began to appear. Partridge (2006) reports on an MA program in Applied Language Studies: Computing at the University of Kent, which ran from 1993 to 2002, and there were a few other degree or certificate programs related to CALL scattered throughout the US, the UK, and elsewhere. 1999 saw the beginning of an important project to bring learning materials to support technology in language teacher education and professional development, the website Information and Communication Technologies for Language Teachers—www.ICT4LT.org (Davies, 2012). The website contained a number of modules useful for self-study or for teacher educators to integrate into their courses. During this time, it was not unusual to find individual teacher educators describing their CALL course experiences at conferences and in publications, but there was little in the way of widespread recognition of the importance of teacher education in CALL and no formal community of practice.

As the title of this chapter suggests, it covers the development of technology skills and knowledge in both formal teacher education settings (typically classrooms) and professional development. The former is often connected to pre-service training and the latter to in-service, but the boundaries are often not that clear. Classes can sometimes be a mix of pre-service and in-service teachers, and even the pre-service teachers may have some informal teaching or tutoring experience that they bring to their coursework. Thus, professional development may include formal coursework, but is commonly some mixture of workshops, webinars, conference presentations, and independent learning, ideally accompanied by relevant readings. For the purposes of this chapter, we consider professional development from the perspective of the provider rather than the teacher receiving it. See Hubbard (2018) for a short overview of the technology and professional development that discusses options for teachers pursuing professional development on their own.

In the remainder of this introductory chapter, I first describe how CALL teacher education moved from its beginnings as independent initiatives by language teacher educators to becoming a recognized sub-field of CALL. I then trace the development of a coherent set of targets for language teacher education, the TESOL Technology Standards. Finally, I provide an example of how I integrated these standards into a CALL course and then modified a significant element of them to fit the student characteristics of the course.

2 Development of Teacher Training as a Sub-field of CALL

The birth of technology and teacher education as an acknowledged sub-field of CALL can perhaps be traced to 2002, when a leading journal, *Language Learning & Technology*, published the first special issue of five papers devoted to the topic. Highlights included a comparative study of expert and novice teachers by Meskill et al. (2002), who found that "those novice teachers who had received 'state of the art' training in classroom technologies use were far less comfortable in their implementations than the more experienced teacher who had no formal training with computers but a great deal of classroom experience" (p. 54). A study by Egbert et al. (2002) following a technology and teacher education course similarly determined that those who had prior technology experience were much more likely to continue integrating technology in their courses after the training.

In terms of edited volumes of relevance in these nascent years for CALL teacher education, Lomicka and Cooke-Plagwitz (2004), while focusing mainly on working with learners and technology, included four chapters clearly related to language teacher education. Two of these, Avendaño (2004) and Cooke-Plagwitz (2004), interestingly involved placing teachers in the role of learners. This is a concept worth considering in any CALL teacher education course. 2006 saw the publication of the first volume dedicated solely to the present topic, *Teacher Education in CALL* (Hubbard & Levy, 2006a). In the first chapter, the editors offered a framework for the field based on *functional* and *institutional* roles. Functional roles recognized that

the teacher could be not only a practitioner but also a developer, researcher, and trainer. Institutional roles included pre-service teachers, in-service teachers, CALL specialists—who focus on using technology for a particular area, like writing or pronunciation—and CALL professionals, who have CALL as their primary career focus (Hubbard & Levy, 2006b). The other 19 chapters included case studies showing a wide range of approaches to teacher education, including several in the types of under-represented contexts highlighted in the present volume. A notable example was Olesova and Meloni (2006), who studied training teachers through collaborative Internet projects in Siberia.

The point of providing this background is to draw attention to the fact that while circumstances have changed, there is value in knowing that educating language teachers to integrate technology effectively has been an ongoing struggle. In the 2020s, teachers—and students—are much more likely to be comfortable with technology for personal and social uses now than they were in earlier days. While there have been some creative and effective solutions for the specific contexts studied, barriers to resolving many of the challenges remain.

In Hubbard (2008), I noted seven of those barriers, reasons why teacher education programs and language programs were often failing in providing teachers with the requisite competencies for integrating technology into their language teaching. Some 15 years later, despite progress in both research and practice, these challenges remain in many parts of the world.

- ***Inertia***. There is a tendency to keep doing what has worked in the past without realizing how the world has changed. Teachers tend to teach in the ways they were taught. And even if they are trained to teach differently, once they start teaching and feel successful, they are less likely to be open to change. This is, unfortunately, a very human position and one which is likely to remain a problem for many teachers—and teacher educators—in future decades. Experiences that place teachers in the role of language learners using technology may be particularly helpful in overcoming this inertia (Kolaitis et al., 2006).
- ***Ignorance***. One form of ignorance is simply a lack of awareness of the technological options available. Another is the assumption that the proper technology itself will do all the work. A third form, documented in Moore et al. (this volume), is the tendency to direct education through top-down curricula and policies that ignore the realities of the local contexts.
- ***Insufficient time***. This is an ongoing issue. More and more content is being thrust into teacher education programs as our understanding of second language acquisition increases, and once free of their degree programs, teachers have little time for professional development (PD) on their own. Fixing the first problem means making technology integration a priority in teacher education or increasing time spent on coursework. Fixing the second involves school and language program administrators providing more support for PD and/or finding innovative solutions such as the microlearning units described in Kohnke and Foung (this volume).
- ***Insufficient infrastructure***. Technology may seem ubiquitous, but we have also become more aware of inequities in the quality and availability of smartphones,

tablets, computers, and the networks that link them to one another and to online resources. The COVID crisis made this digital divide even more apparent (Williams et al., 2021). This is an issue particularly relevant to the types of contexts this volume is dedicated to.

- ***Insufficient standards***. A major challenge in teacher education and professional development is having clear objectives. The same year this list was generated, 2008, TESOL published a set of standards for language teachers and learners: these are discussed in detail in the next section with an emphasis on their adaptability (TESOL, 2008).
- ***Lack of established methodology***. A major question in teacher preparation is whether a preparatory technology course or courses should be separate, perhaps at the beginning rather than the end of a program (Hegelheimer, 2006) or whether technology instruction should be integrated as relevant throughout the program. Beyond timing, some general processes for teacher development include lecture, demonstration, project-based, situated learning, reflective learning, portfolio-based, mentor-based, communities of practice, and self-directed learning. To this list, we could add various types of collaborative learning, including teacher education through virtual exchange (Loranc et al., 2021). Although arguably there is no one ideal methodology for CALL teacher education, it has become increasingly clear that lecture and demonstration alone are insufficient. This is one area that has improved markedly since 2008. A teacher educator developing a class or workshop or teachers themselves pursuing independent professional development can readily find valuable resources online: see the appendix of Hubbard (2021b) for some examples.
- ***Lack of experienced, knowledgeable educators***. There are certainly more technology-competent teacher educators now than 15 years ago, but the shift to emergency online teaching in 2020 made it clear that *all* language teachers have to be able to teach with and through technology. There remains a need for ongoing "train the trainer" programs (Rickard et al., 2006) so that teacher educators can build a foundation and maintain it through their own ongoing professional development.

Facing up to these challenges, as technology in teacher education became more common, the field made additional strides toward its professionalization. Teacher educators formed special interest groups devoted to technology and language teaching in CALICO in 2004 and EUROCALL in 2009, often sponsoring panels at their respective conferences. CALICO published an edited volume on the topic (Kassen et al., 2007) that included three chapters on the use of digital portfolios. In 2015, *Language Learning & Technology* released a second special issue on technology and teacher education. Articles in that issue showed how the field had expanded beyond a technology competency focus. For example, Shin (2015) reported on providing teachers with an understanding of ethical and legal issues, while Liu and Kleinsasser (2015) explored the use of the TPACK model (technological pedagogical content knowledge; Koehler & Mishra, 2009) for in-service teaching. A number of articles describing CALL teacher education around the world appeared in other

journals and as chapters in edited volumes. An edited volume by Son and Windeatt (2017) devoted solely to the topic offers a particularly useful sample of nine case studies by established teacher educators across a range of contexts.

Besides research and development studies, several theoretical frameworks and models from the past decade are worth noting. Torsani (2016) published an important monograph devoted to technology and language teacher education, which includes a proposed theory of CALL curriculum and course design. Schmid's (2017) monograph introduces a Teacher Education in CALL (TECALL) model grounded in sociocultural theory. Son has developed two models that interconnect. The first is based on exploration, communication, collaboration, and reflection, or ECCR (Son, 2018). These four components interact in an ongoing process of technology-competent teacher development. In Son (2020), he embeds this model in a broader Digital Language Teacher Development Framework, or DLTDF that recognizes a teacher's growth process through beginner, intermediate, and expert stages.

Interestingly, the present volume includes several additional models that have emerged primarily from the localized context in which teacher education is occurring. As noted above, Kohnke and Foung (this volume) show how teacher educators can use a microlearning model to engage teachers in professional development in a more motivating and situated manner than with the usual conference presentations, workshops, and webinars. Ngo and Nguyen (this volume) describe a model they created that synthesized elements of communities of practice, TPACK, and the British Council's continuous professional development framework. Moore et al. (this volume) have created a mixed model to address the all-too-common conflict between national top-down curricular mandates involving technology and the reality of teaching in the local context. Finally, McCallum (this volume) reviews theories used for CALL in under-represented research contexts and offers suggestions for future directions in theory application.

3 TESOL Technology Standards

There have been a variety of standards proposed for technology and education over the years, notably several versions from the International Society for Technology in Education (https://iste.org) and UNESCO's (2018) ICT Competency Framework for Teachers. Although such sources provide guidance for education in all subject areas, they are not specific to language teaching and learning. Arguably, the TESOL Technology Standards for Learners and Teachers represents the most significant undertaking to date in technology integration by a professional organization that is specifically focused on this domain.

In early 2006, TESOL appointed six CALL scholars, including me, to the Technology Standards Writing Team chaired by Deborah Healey. Our task was to produce separate sets of standards for classroom teachers and language learners. The group had several meetings in person and online to collaborate in drafting tentative sets of the Standards, which were then presented at US and international conferences and

on a dedicated website for public feedback and discussion. Taking those insights into account, a second draft was completed, and the TESOL Standards Committee selected a team of international experts to provide a peer review and make recommendations leading to the finalized version. Introductory material motivating the need for the Standards and providing a rationale for the choices made in producing them were added. The resulting document was published as the *TESOL Technology Standards Framework* (TESOL, 2008) and became TESOL's first ebook. In that document, the Standards were accompanied by a set of performance indicators to help teachers and teacher educators interpret them and sample vignettes, realistic scenarios showing how a given standard could be implemented in an English language class. In Healey et al. (2011), the writing team expanded the offering to a full set of vignettes covering all of the teacher and learner standards. Importantly, each standard had separate vignettes for high, mid, and low technology resource contexts. The importance of acknowledging this low-resource category is reflected in some of the under-represented contexts noted in this volume, such as those by Meskill et al. in rural areas of Brazil, China, and Indonesia during the emergency online teaching and learning of the COVID crisis. Other features of interest in the 2011 volume are separate chapters covering the theory and research basis of the Standards, their concordance with ISTE and UNESCO standards, language program administrators, online teaching, and teacher educators, the last echoing many of the points discussed above.

Although the TESOL Standards for Learners are an important element of the overall project, here, we focus solely on the TESOL Technology Standards for Teaching, or TTST. In all, there are 14 teacher standards, divided across four high-level goals. As an example, the first standard states "Language teachers demonstrate knowledge and skills in basic technological concepts and operational competence, meeting or exceeding TESOL Technology Standards for students in whatever situation they teach." To save space and avoid the full detail of the standards language, I describe them here in simpler terms than the original (see TESOL (2008) for the exact wording of all goals and standards). The four goals concern (1) technological skills and knowledge; (2) technology-pedagogy integration; (3) technology in record-keeping, feedback, and assessment; (4) technology for communication, collaboration, and efficiency. The simplified description of each standard appears in Table 1.

The standards themselves are obviously very general, even in their original form. In order to provide more precise learning targets, the framework in TESOL (2008) included a set of performance indicators (PIs). For example, Goal 1, Standard 3 (Evaluate, adopt, and adapt new technologies throughout teaching career) had the following PIs:

- Language teachers utilize technology tools to expand upon a conventional activity.
- Language teachers keep up with information through a variety of sources (e.g., books, journals, mailing lists, and conventions).
- Language teachers participate in a relevant community of practice.

Table 1 Simplified TESOL Technology Standards for Teachers. G = Goal; S = Standard

G1S1	Have basic technological competence at least equal to that required for students
G1S2	Understand a wide range of relevant technology supports and options for use
G1S3	Evaluate, adopt, and adapt new technologies throughout teaching career
G1S4	Use technology in socially and culturally appropriate legal and ethical ways
G2S1	Identify and evaluate technological resources for suitability to teaching context
G2S2	Coherently integrate technology and pedagogical approach
G2S3	Design and manage technology-mediated activities and tasks to meet curricular goals
G2S4	Use relevant research findings to inform technology use in activities and tasks
G3S1	Evaluate and implement technology for assessment
G3S2	Use technology to collect and analyze data to enhance language learning
G3S3	Evaluate student uses of technology to support their language learning
G4S1	Use technology to communicate and collaborate with peers, students, and other stakeholders
G4S2	Regularly reflect on the intersection of professional practice and technology
G4S3	Apply technology to improve efficiency

- Language teachers explore the possibilities inherent in emerging technologies with a critical eye.

These PIs represent targets for a basic level of teacher technology competence. The 2008 framework also included PIs for the "expert level" so that a more enhanced knowledge base and skill set could be recognized. In Healey et al. (2011), the PIs from the framework document were expanded into a set of 160 "can do" statements for easier self-evaluation and tracking of individual teacher development. I discuss these further below.

Although the TESOL Technology Standards were first published in 2008, they have proven to be remarkably flexible and enduring despite the enormous shifts in technology. A Google Scholar search for the exact match "TESOL Technology Standards" and limited to those since 2018 yielded 221 publications, showing that the standards are still being regularly referenced in academic literature. Hubbard (2021a) provides examples of how the standards have been incorporated into research, course design, and even the development of a full MA curriculum. For readers of the present volume, the TESOL Standards provide an important resource because of their combination of relative comprehensiveness and flexibility to specific contexts. As an example of that flexibility, in the remainder of this section, I describe how I first integrated the Standards into a CALL course and then adapted a particular element to fit the context I was teaching in. By doing so, I hope to demonstrate that the Standards remain a relevant resource for CALL teacher education. Much of what follows is described in more detail in Hubbard (2021a).

In 1998, I first offered a CALL "mini course" as an optional 1-unit seminar attached to my SLA and teaching methodology course titled "Linguistics and the

Teaching of English as a Second/Foreign Language" at Stanford University. It was a mini course because it only met once a week for an hour or so for 6–8 weeks. The goal was to provide students with a broad but shallow overview of the range of technology applications for language teaching and learning. In most years, I had 4–10 students, so there was a lot of room for individualizing. Some of my students were undergraduates planning to go abroad to teach English for a year or two following graduation; others were MA or PhD students in language or technology areas of the Graduate School of Education. I also often had teachers who were visiting the Language Center for a year teaching their native language at Stanford before returning to places like Egypt, Turkey, or the Philippines to teach English afterward.

As a member of the writing team, I had been involved with the Standards since 2006, but I did not begin formally integrating them into my class until 2012. That year, I had students fill out the "can do" statements from Healey et al. (2011) at the end of the course. Here is an example of two such statements from Goal 2, Standard 3 (Coherently integrate technology and pedagogical approach):

> I teach students how to evaluate online resources
> I clearly explain the pedagogical purpose of the technologies I use and that I ask students to use

In each case, individuals would rate themselves as meeting the statement target very well, adequately, not so well, not at all, or NA (not applicable).

By the time students filled out the forms in the final week of the course, we knew each other well, and I typically set up meetings so that we could review areas of weakness to see whether they needed to keep working on these on their own, depending on their immediate teaching plans. Then, in 2019, I made what I thought was a minor change.

I decided to shift the filling out of the forms from the last to the first week of the course, reasoning that this would give students a clearer understanding of what they might need to learn *during* the course. All but one of the six students in the 2019 cohort were truly pre-service, with no formal teaching experience. At the next class meeting when we discussed the forms, I was faced with a number of student concerns along the following lines:

- The can-do says "I teach students how to evaluate online resources," but I don't have students [the can-do statements are generally presented in that form].
- The can-do statements include expert level ones—these aren't relevant for a beginning course.
- The number of statements (160) is too large.

Following discussions with students about the incompatibility of the statements with their experiences, I decided to make some adjustments for 2020:

(1) Go back to the original performance indicators (PIs) from TESOL (2008)—95 instead of 160.
(2) Eliminate the "expert level" ones—65 instead of 95.

(3) Revise the third-person 65 PIs to first-person can-do statements but change the wording so that it really says what they *can* do rather than what they *actually* do.

For example, for Goal 1, Standard 3 (Evaluate, adopt, and adapt new technologies throughout teaching career), the PI "Language teachers participate in a relevant community of practice" became "I know how to find and participate in a relevant community of practice" (indeed, this is a point we discuss later in the course). The 2020 class of four students had a positive response to the revised set (especially when told the old set had 160 items). I had originally planned to follow up with all of them, but due to the onset of COVID-19 protocols in March 2020, the last class meeting was canceled and in the ensuing upheaval only one student got back to me with data on how she had improved in select areas as a result of the class: see Hubbard (2021a) for details. For those interested, the full set of the 65 revised can-do statements can be found at https://web.stanford.edu/~efs/TTS-CDs.pdf, and the CALL course notes are available as a free ebook, Hubbard (2021b).

Readers who have not had a chance to see the TESOL Technology Standards are encouraged to do so through the link provided in the references under TESOL (2008). For anyone using or planning to use the TESOL Technology Standards as part of their coursework, I encourage considering adaptations such as the one I describe above. I suspect that in a number of under-represented contexts, the TTST will need some pruning, shaping, and even augmentation to make them fit appropriately.

4 Conclusion

In this opening chapter, I first provided an overview of the history and development of technology and language teacher education, highlighting the range of options and challenges in this domain with an eye toward relevance to this volume's theme of under-represented contexts. I then introduced the TESOL Technology Standards for Teachers and showed how I first integrated them into my CALL course and then adapted one element of them, the "can do" statements, to fit the realities of the generally inexperienced students. In the remainder of this volume, readers looking for ideas that will help them with the CALL teacher training or professional development will see an array of alternatives to using the TTST, providing a rich set of options to draw from that may best fit their own context.

In the past few years, we have experienced rapid changes in digital technologies developed or adapted for language teaching and learning purposes. We can expect the rate of that change to continue to accelerate. However it is attained, teachers need a knowledge and skill base that will accommodate that change, but they also need the competence and confidence to incorporate those changes reflectively in their teaching contexts. This book provides language teacher educators and teachers seeking professional development with a critically needed set of case studies to help meet this challenge.

As a final note, in preparing this chapter it once again brought to mind the fact that there are no standards that I am aware of for language teacher educators themselves. The "Coach" role of the ISTE Standards has some overlap, but that role seems to be closely tied to being the technology expert (across fields) for a school, school district, or other institution: see a description at https://www.iste.org/standards/iste-standards-for-coaches. Perhaps a place to start would be to rephrase the TTST to apply to teacher educators rather than teachers. For example, Goal 1, Standard 1 could be transformed to "Language teacher educators demonstrate knowledge and skills in basic technological concepts and operational competence, meeting or exceeding TESOL technology standards for teachers in whatever situation they teach." It is likely that similar adjustments could be made for other standards with requisite shifts in wording. If, in fact, *all* teacher educators (not just those teaching CALL courses) were to meet such targets in a given teacher education program, I suspect the result would be a much more digitally literate and effective graduating class of language teachers.

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