Digital Technology in Three Middle School ESL Language Arts Classrooms

Elena Andrei, Coastal Carolina University, South Carolina, USA

Introduction

Evidence indicates that technology integration in the language learning classroom leads to increased participation, engagement, and collaboration among students (Huang & Lin, 2011); a positive classroom climate conducive to language learning (Wang & Vásquez, 2012); and improvements of English language learners' (ELLs) language learning (Felix, 2005). The mere presence of technology, however, does not lead to improved teaching and learning by itself; technology use needs to follow good instructional strategies. Use and implementation of technology in the classroom may range from mere "substitution" of old technology with new technology to "modification" and "redefinition" of instruction (Puentedura, 2012) as will be explained in this paper's theoretical framework section.

Use of email and instant messaging allows for interaction and can engage language learners in written and face-to-face video communication and interaction (Chapelle, 2003). Use of texts as a way to engage language learners can enhance learning of idioms (Hayati, Jalilifar, & Mashhadi, 2013). Blogging increases language learners' confidence (Wang & Vásquez, 2012); blogs, wikis, and social-media sites increase student interaction and collaboration as well as interest and motivation (Wang & Vásquez, 2012). Technology provides students access to a variety of authentic materials and resources in the second language, increasing their language receptive abilities and skills, such as listening or reading (Zhao, 2003).

Liu et al. (2002) reviewed both research-based and non-research-based articles on technology use in foreign- and second-language classes published between 1990 and 2000. The review suggests that "…the use of visual media supported vocabulary acquisition and reading comprehension and helped increase achievement scores. The use of online communication tools has been shown to improve writing skills in a number of studies" (p. 262).

Technology integration helps with student achievement and content learning. Page (2002) found that students in classes with integrated technology scored better

on math achievement tests than students in classes with little or no technology available. Students from both the treatment and the control group were also tested with a self-esteem instrument (Coopersmith Self-Esteem Inventory) in the fall and then in the spring. Based on self-esteem inventory scores, students in technology-integrated instruction had higher levels of self-esteem after the treatment (Page, 2002).

Theoretical Framework

Throughout the following sections I use Puentedura's (2012) SAMR (Substitution, Augmentation, Modification, and Redefinition) model of technology integration. Puentedura (2012) talks about four levels of technology integration: substitution, augmentation, modification and redefinition, which represent the range of technology integration from the most basic, unsophisticated integration, ("substitution"), to a more advanced and sophisticated integration which leads to "redefinition" (of instruction). Table 1 below summarizes the SAMR model as explained by Puentedura (2012).

Table 1. SAMR (Substitution, augmentation, modification and redefinition) Model

Level	Definition
Substitution	Old technology is replaced by new technology; instruction and assignments remain the same.
Augmentation	New technology replaces old technology; instruction and assignments are enhanced by the affordances of the new technology.
Modification	New technology allows for modified assignments and instruction.
Redefinition	New technology allows for new assignments and instruction to be implemented.

Source: Puentedura, R. R. (2012). *The SAMR model: Background and exemplars*
Retrieved from http://www.hippasus.com/rrpweblog/archives/2012/08/23/SAMR_BackgroundExemplars.pdf

Purpose of the Study

Studies on technology and language learning have not typically focused on K-12 settings (Wang & Vásquez, 2012). Consequently, Liu et al. (2002) called for more research at the K-12 level. And Wang and Vásquez (2012) noted that "…future research should also explore how learners in primary and secondary educational settings as well as in more informal learning contexts, are using Web 2.0" (p. 424).

The purpose of the current study, which is part of a larger research project on technology in the classroom, was to examine ways in which three English as a Second Language (ESL) middle school teachers use available digital technology,

such as digital boards, computers, iPads, and iPods, with ELLs in the Language Arts classrooms to promote ELLs' language and Language Arts content learning. The question of this study stems from research that suggests technology helps with language and content learning. The question of the study is: How do three ESL middle school teachers use the digital technology they have in their ESL Language Arts classroom to teach ELLs?

Method

Context and Participants

The study was conducted in the fall of 2012 in a middle school in a mid-sized town in the United States. The participants in this study were three ESL teachers at West Middle School (all names used are pseudonyms), and the ELLs in their ESL Language Arts classes, out of which four were focal students. The three ESL teachers were all licensed to teach ESL and had previous teaching experience. At the time of the study, Ms. Jones and Ms. Miles had 5 years of teaching experience, while Ms. Wong had 4 years. Besides ESL certification, Ms. Miles was also Spanish certified and Ms. Wong was Language Arts (regular English language curriculum for native speakers) and History certified. All three teachers were White and relatively young professionals. The three teachers each taught one Language Arts class to ELLs daily. Each of the teachers was responsible for a different group of students in her ESL Language Arts classes as shown in Table 2. Note that the teachers changed the students in their ESL Language Arts classes three weeks into the study in an attempt to better serve students.

The four students were selected to represent different grade levels, various English proficiency levels, different nationalities, and native languages (see Table 3).

Table 2. Teachers and Language Arts classes

Teacher	ESL LA class before the change	ESL LA class after the change
Ms. Jones	6th grade	Intermediate[1]
Ms. Wong	7th grade	Newcomers
Ms. Miles	8th grade	Advanced

[1] The newcomers, intermediate, and advanced labels used by the teachers refer to their students and their English language proficiency levels based on WIDA scores and on classroom assessments.

Table 3. Student Participants

Student	Grade	Country of origin	Age	Date of U.S. arrival	WIDA1 scores: overall; reading (W-APT or ACCESS)	Languages spoken besides English	English classes in home country
Kiano	6	Kenya	11	May 2012	2.7; 2 (W-APT)	Swahili; Kikuya	Yes
Mei	6	China	11	April 2012	4.6; 4.5 (W-APT)	Chinese	Yes
Vihan	7	India	11	April 2012	2.1; 1.9 (W-APT)	Gujarati; Hindi	Yes
Ali	8	Jordan	14	June 2010	2.2; 1.9 (ACCESS)	Arabic	No

[1] WIDA refers to the language proficiency tests (either W-APT or ACCESS) used at West Middle School to assess English language proficiency. A score of 1 is the lowest level language proficiency, while a 6 is native-like language proficiency.

While research is also needed at the elementary and high school levels, this study focused on middle school classrooms for two reasons: (1) because middle grades are transitional years for ELLs, and (2) because ESL middle school classes, more specifically ESL Language Arts classes, in the school district studied, are generally self-contained classes taught by ESL teachers exclusively to ELLs. At West Middle School, ELLs have their Language Arts content-area class as an ESL Language Arts class taught by ESL teachers. In these classes, the ESL teachers are responsible for teaching the English language and the Language Arts curriculum and for reaching the language and content standards for the respective grade level.

Statistical Procedures

The study followed a qualitative-interpretative approach, specifically an analytic-induction methodology (Erickson, 1986). Data collection consisted of nine teacher interviews (three for each teacher), eight student interviews (two for each student), weekly observations of the three Language Arts classes for a period of 10 weeks, students' Language Arts class notebooks, and classroom documents including PowerPoints and handouts. Data collection, organization, and analysis were parallel and iterative processes. During data collection, I wrote up my observation notes, created weekly memos, and kept a methodological journal.

When all of the data was collected, I read the data corpus in its entirety (including write-ups, analytic memos, the methodological journal, and interview transcripts) and identified emergent themes and possible assertions (following Creswell, 2012). I checked these possible assertions against all the data to assure that any themes and assertions were based on the collected information. The multiple data sources allowed me to triangulate data and base assertions and findings across data sources (Erickson, 1986).

Results

Available Digital Technology

This section summarizes the digital technology available to the three ESL teachers and their students. Each teacher had digital technology readily available in her classroom that could be used exclusively in that class (see Table 4).

Table 4. Available Digital Technology in the ESL Classrooms

	Digital board	Overhead projector for the digital board	Teacher laptop	Document camera	Desktop	iPad	Internet connection (cable and wireless)
Ms. Jones	X	X	X	X	X		X
Ms. Wong	X	X	X	X	X	X	X
Ms. Miles	X	X	X		X		X

In addition, there was digital technology that was available only to the three ESL teachers that they shared as an ESL Department (see Table 5).

Table 5. Digital Technology Available at all Times through the ESL Department

Technology	Number of units available
Laptop	4
iPod (Touch) with headsets	15

The school also had two computer labs: one PC desktop lab on the same hallway as the three ESL classrooms, and a Mac desktop computer lab; an iPad cart; and several laptop carts. The library had four desktop computers. According to

Ms. Jones, the school also had photo and flip cameras, iPod touches, and small tablets on which users could write and project on digital boards (personal communication). School-wide available technology (iPod carts, computer labs, photo and flip cameras) was used less frequently than classroom or ESL Department technology; only one lab, the PC desktop lab, and the desktops from the library were used by ESL teachers during this study. The one observed instance when the PC lab was used was when all three teachers and all their students were having the same class and the same activity in the same class period. Instead of concentrating on this rarer usage, this study focuses and reports on the most frequently used technology teachers employed: digital boards used in conjunction with the projectors and teacher laptops, computers, iPads, and iPod touches.

If we think of technology integration in the classroom as a way to enhance the learning of content matter concepts, generalizations, and skills (Banister & Vannata Reinhart, 2011), then the digital technology available to the three ESL teachers was integrated and viewed by teachers and students as support and as a resource for second language and/or Language Arts content learning. Teachers were using available technology not in sophisticated ways, but in old ways so that the potential of the technologies for instructional purposes was not reached. The teachers were using the new technology most times as mere "substitution" of old technology and only rarely as "redefinition" of instruction (Puentedura, 2012). The collected data yielded some common instances of technology integration during the study.

Instructional Uses

Digital Boards.

The digital board each of the teachers had in her classroom was connected to the teacher's laptop or document camera and used to show daily dialogue journal writing prompts, to review Language Arts content, to give instructions, and/or to model and explain tasks to students.

Daily dialogue journal. The digital board was used almost daily by all three teachers. The most common use was for sharing the dialogue journal writing prompt of the day at the beginning of the ESL Language Arts block. The prompt was sometimes related to Language Arts content but not always. For example one

prompt read: "Describe our class using an example of figurative language (hyperbole, personification, simile, metaphor)". This prompt was directly related to Language Arts content Ms. Miles was teaching that week. Another prompt from Ms. Jones's class read: "How was ICA on Friday? Did you find your activity enjoyable? Did you meet new people? Who was your teacher?" This prompt, which asked students to free write about a school-wide Friday electives activity, was not directly connected to the Language Arts content. Both these prompts aimed at developing students' communication writing skills.

The students considered the use of the digital board important for their learning, allowing them to see the dialogue journal prompt or draw from ideas displayed on it. For example,

Kiano mentioned that the digital board "...helps you that you see what's there and you can put in your notebook."

Vihan said the digital board allowed him to see the dialogue journal prompt, models or ideas students could use: "To show that – what's the question, and we can use – what she did or what she always do is put some ideas beside it, and we can use them."

All three teachers read dialogue journal prompts to students before asking them to write. Sometimes they also explained and/or rephrased for the students what they were being asked to write about. This way, the content of the dialogue journal prompt was delivered to the students in various modalities: visual, audio, and rephrasing to ensure comprehensible input.

However, for the prompt to be shared with students, the teachers did not necessarily need digital boards. They could have used the available white boards in their classrooms in the same manner; in other words, digital board integration happened at the basic level of "substitution" (Puentedura, 2012).

Content review. The digital board was also used to review Language Arts content. For example, in Ms. Miles's class, when students were working on figurative language, she reviewed types of figurative language as a whole-class activity using PowerPoint. Individual students, when called on by Ms. Miles, had to decide if the sentence was a metaphor, simile, hyperbole, or personification. The PowerPoint had one sentence per slide and an accompanying visual in the form of a picture. The way the activity unfolded allowed Ms. Miles to provide immediate feedback

and possible scaffolding for students to identify the figurative language correctly. Ms. Miles encouraged peer interaction to help students respond correctly. The PowerPoint use allowed for multiple representations that could help with language learning. However, this activity could have been accomplished with an overhead projector. This suggests again that teachers used the digital board merely at the "substitution" level (Puentedura, 2012).

In another instance of using the digital board to review content, Ms. Miles led a review on Latin roots. She posted on the digital board a table with the roots to be reviewed. After students individually worked on the roots (students were given a worksheet with a table of Latin roots), they were asked, one by one, to come to the digital board to fill in the table with the meaning of the roots and examples. Figure 1 shows the table Ms. Miles posted on the digital board; the table resembled the worksheet the students had worked on individually. This activity used the interactivity of the digital board more as the students wrote on it, but it did not add benefit to instruction more than a white board or document camera would have.

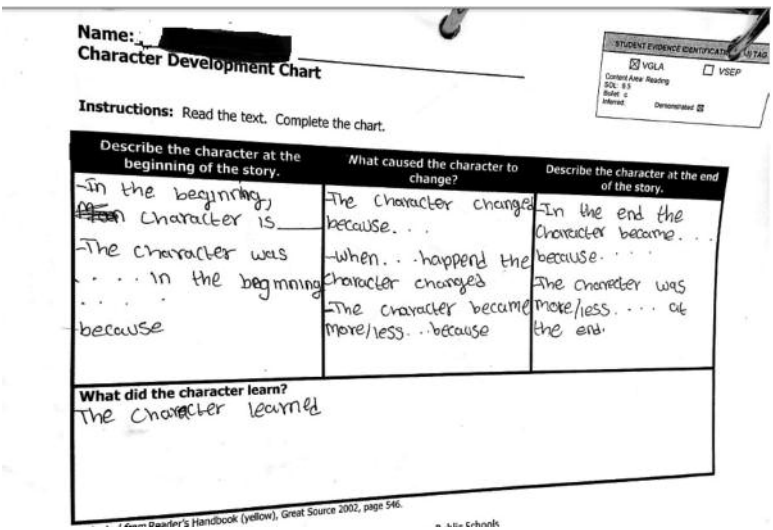
	Definition	Example
Audi		
Dict		
Port		
Rupt		
Scrib/script		
Spect		
Struct		
Tract		
Vis		

Figure 1. Digital Board Table to Review Language Arts Content

Model and provide instructions. The digital board was used to model how to take notes. Showing students how to accomplish a task is a way to support their learning and accomplishment of complex tasks which they would not be able to do without support (Walqui, 2006). For example, Ms. Wong conducted an experiment with the students and showed them how to fill in their experiment notes on a worksheet she had under the document camera. The students in her room were newcomers, and the fact that Ms. Wong wrote and showed them how to fill in the experiment worksheet provided a model for the students. Thus, the digital board and the document camera became a support for students. In this case again, the digital board and its capabilities were not used at full potential. The digital board

was used at the "substitution" level (Puentedura, 2012) as a mere replacement for the white board.

Also, in another instance, Ms. Jones used the document camera via the digital board to share sentence starters to help students complete an upcoming assignment. While Ms. Jones was filling in the worksheet, she was talking and prompting the students about what they would say and write as their sentence starters. This use of the digital board allowed Ms. Jones to model for students how to fill in the worksheet and ensured that all of them had the language resources, the sentence starters in this case, to finish the assignment. Modeling and language support help ELLs to be successful and perform instructional tasks that might otherwise be too complex for them, given their language proficiency levels. Figure 2 shows a completed worksheet from one of the students. In this example, as in previous ones, the digital board was used like a projector.


Name: [redacted]
Character Development Chart

Instructions: Read the text. Complete the chart.

Describe the character at the beginning of the story.	What caused the character to change?	Describe the character at the end of the story.
-In the beginning, ~~the~~ character is____ -The character was . . . in the beginning . . . . -because	-The character changed because. . . -when. . .happend the character changed -The character became more/less. . .because	-In the end the character became. . . because. . . -The character was more/less. . . . at the end.

What did the character learn?
The character learned

Figure 2. Notes Page Filled in by Student (Kiano, Ms. Jones class)

Summary of use. There are several reasons why digital boards in the three classrooms were not used and integrated at full capacity at the levels of "modification" or "redefinition" (Puentedura, 2012). A digital board can represent material in multimodal ways (visual and audio) and can allow for student engagement with the material (Mechling, Gast, & Krupa, 2007) by creating, modifying and/or

adding to it; and can access resources such as websites, videos, or simulations (Preston & Mowbray, 2008). In Ms. Wong's case, the digital board in her classroom did not work properly.

Ms. Wong was aware of the possibilities of the digital board software, but the repeated technical difficulties prevented her from using the digital board at full capacity. In addition, the time needed to invest in developing materials for the digital board seemed to be an obstacle in using all its capabilities. In the same vein, Ms. Jones mentioned the lack of time needed to use new technologies as obstacles in integrating new technology even more in the classroom. Ms. Wong also noticed the time invested in developing materials or content on the digital board would be worth it only if she could re-use the materials.

Computers and iPad.

This section illustrates how the available computers (both desktops and laptops) and the iPad were being used for student activities to learn and practice the language and facilitate meaning making.

English language learning. Students in Ms. Wong's class used several language learning websites they could access on computers or on the iPad for their English language learning. The following were websites Ms. Wong assigned her newcomers to use or allowed them to choose from: www.raz-kids.com, www.littlebridge.com or www.spellingcity.com. These websites were intended to help the students learn and practice spelling (www.spellingcity.com); learn and practice basic language words and expressions such as colors, objects and rooms in the house, or greeting people (www.littlebridge.com); or practice reading by following along the computer read aloud (www.raz-kids.com).

PowerPoint presentations. In only one observation students were observed creating PowerPoint slides on computers themselves. Ms. Miles asked her students to create a PowerPoint presentation to present types of texts such as lists, sequence of events, or similarities and differences. These allowed students to show what they know by employing both text and visuals. In this specific class, students were asked to show what they know related to a Language Arts content standard.

Google applications. Google Images and Google Translate were used to facilitate vocabulary learning or meaning making and were generally used in smaller groups or one-on-one activities. Both Ms. Jones and Ms. Miles used Google Im-

ages to show and/or remind students of the meaning of spelling words they were practicing. Since Ms. Wong had the iPad in her room, she used that for Google Images; Ms. Jones used her laptop. Other ways of conveying the meaning as an alternative or complement to Google Images were drawing on a small white board, looking the word up in a print-based bilingual dictionary, acting out words, or giving examples.

Ms. Wong used Google Images more often than other teachers, possibly because as teacher of the newcomer group, she taught students with lower English proficiency levels who were in the process of learning new words and expressions. Google Images afforded Ms. Wong and her students quick representations of various new vocabulary words whose meaning students did not know.

Students used Google Translate as a resource to help with reading. For example, in Ms. Wong's room, a student had Google Translate open in a tab next to the www.raz-kids.com site where he read a book with colored pictures. From time to time, while reading he would type and check meanings of words he found in the reading in his native language, using Google Translate.

In interviews, students mentioned they considered that use of computers in the classroom helped them learn and supported them with their language. The students mentioned the computers and the Internet allowed them to find and learn information they needed; listen to books; type faster and get mistakes corrected.

Computers and iPad level of integration. In comparison with the digital board, the computers and the iPad seemed to be used in more sophisticated ways that enhanced the tasks. Computer and iPad integration appears to be at the "augmentation" stage (Puentedura, 2012). Students seemed to be comfortable using and accessing different websites and applications on the computers. However, besides the language learning websites, creating PowerPoint presentations and the Google applications, no other use of computers and iPads was observed during this study (e.g., doing research on the web on a certain topic, blogging, creating wikis or podcasts, and use of various iPad applications for language and content learning).

iPods.

Reading fluency. For reading fluency, I observed Ms. Miles and Ms. Wong use the iPods with newcomer students: students practiced reading a text aloud, recorded it on iPods, and then listened to their recordings. After students listened

to the recordings, they decided to record again or shared their recordings with the teacher for feedback. Ms. Jones was not observed using the iPods for reading fluency, but in an interview she said she had been using them with her students, too.

Spelling tests. The teachers recorded spelling tests on iTunes. As a note, the teachers used the label "spelling tests" in a somewhat misleading way. The tests and the objective of the activity of practicing new words that have a common spelling forms or patterns was to study new words both in terms of their spelling but also in terms of meaning and usage.

Each student, depending on his/her diagnostic assignment and progress, was given a different list of words and subsequently tests that addressed his or her needs. According to Ms. Jones, the word lists and tests were from a book *Words their Way* (Helman et al., 2012) that targets spelling, decoding, and phonemes. The advantage of having these tests recorded on iPods was twofold: teachers could differentiate the tests to address students' needs and progress; and students could listen to the words as many times as needed. When asked about this, students acknowledged that it was helpful.

There is value in practicing the phonemes of English with ELLs, especially phonemes that are not common to their native language, as it helps develop ELLs' reading and writing (August & Shanahan, 2006). Different students who come from different countries and had different native languages need more support with some aspects of phonemes than others.

The iPods afforded the students the independence of listening to the tests as many times as they needed so they could be successful and allowed for differentiation of tests based on students' readiness and language proficiency levels.

iPod level of integration. In both cases of iPod use—fluency and spelling—the technology was used and integrated to support language learning at the "augmentation" level, allowing assignments to be enhanced by their affordances such as availability of a digital collection of recordings. In terms of other possible usages, Ms. Miles acknowledged: "We haven't been using them [the iPods] as much for the apps. We haven't had the time to invest in looking, creating, and downloading apps to say, 'Here, go ahead and try out these things.' That just hasn't been on the radar of priorities for this year." As with the use of the digital board and the creation of content using the digital board software, there seemed not to be "enough

time" to plan for more technology integration in the classroom. Lack of time seems to be an obstacle for more technology integration in the classroom and a more sophisticated way of using it, although one wonders if this is possibly the verbalization of a psychological barrier.

Implications and Conclusion

The previous sections provided examples of technology integration in three ESL classrooms that enhanced language and content learning. The use of the digital board for the daily dialogue journal prompt created opportunities for development of written communication skills. Modeling and language support using the digital board allowed students to perform academic tasks. The use of language learning websites that employ both visuals and audio allowed for multiple representations of content. The use of images and translations of unknown words in students' native language helped with language learning and meaning making. The use of iPods to practice fluency and phonemes allowed students to produce the language and provided opportunities for language learning and reading.

However, the integration of available technology in many ways was not sophisticated, and could be expanded so that further capabilities of technology are used in more interactive and hands-on ways, engaging students and enhancing instruction. Most times, technology level of integration in the three ESL classrooms was at the "substitution" level with some instances of "augmentation." The digital boards, although employed on a daily basis, were typically used in much the same way as old technology (projectors or white boards). Digital boards have the capacity of being immediately sensitive to classroom discussion topics and students' needs by having access to Internet and various digital board software applications. The iPods and the iPad could have been used more with language and content learning applications; likewise, no iPod applications were used for language or content learning. The three teachers themselves, central office staff, instructional coaches, peers, and outside experts could identify, test, and recommend to teachers available new technology applications targeted towards language and content learning for ESL students. In addition there are app review sites where teachers can go and find educational applications that are available.

The technology the students and teachers in this study had access to was varied and up to date. The digital boards, document cameras, computers, iPods and In-

ternet connection are all potentially great tools which can engage students and teachers in teaching and learning of both language and content. However, the mere presence of technology does not lead to a sophisticated use that takes advantage of all its capabilities and affordances. Technology in these three classes was used in old ways (at the "substitute" or "augmentation" levels) rather than sophisticated, interactive, hands-on ways, at the "modification" and "redefinition" levels (Puentedura, 2012).

In the context of technology use in everyday life, schools have been trying to gain new technological equipment such as computers, Internet connectivity and bandwidth, and software applications in order to prepare students for the 21st century (Cuban, 2001). If the available technology is not used at its maximum capacity and in more interactive and more sophisticated ways, there is a loss of resources and opportunities for students and their learning. In this era of globalization, multiculturalism, and ever-present and ever-changing technology, students need to have learning skills (be able to effective communicate and collaborate efficiently, be problem solvers and critical thinkers); life skills (be able to use knowledge and skills to adapt to current and future circumstances); and technology skills (use technology and identify credibility of information and sources), often labeled as 21st century skills (The Partnership for 21st Century Skills, 2011).

Technology integration in schools should enhance instruction by allowing and empowering students to construct their own meaning and use their prior knowledge (Richards, 2005). Technology integration does not mean merely replacing the LCD with a digital board; in other words, technology use and integration must go beyond the simple superficial changes that replace one tool with another newer one (Jacobs, 2010). Technology integration should be used at the higher levels of integration as identified by Puentedura (2012), "modification" and "redefinition". Thus, there should be a "… focus on teaching with technology — rather than introducing technology as an available yet peripheral tool —emphasizing technology as an integral tool with diverse uses and inherent potential to enhance teaching and learning…" (Russell et al., 2003, p. 309).

References

August, D., & Shanahan, T. (Eds). (2006). *Developing literacy in second-language learners: Report of the National Literacy Panel on language-minority children and youth*. Mahwah, NJ: Lawrence Erlbaum Associates.

Banister, S., & Vannata Reinhart, R. (2011). TPCK for impact: Classroom teaching practices that promote social justice and narrow the digital divide in an urban middle school. *Computers in the Schools, 28*, 5–26. doi: 10.1080/07380569.2011.551086

Chapelle, C. (2003). *English language learning and technology: Lectures on applied linguistics in the age of information and communication technology.* Philadelphia, PA: John Benjamins Publishing Company.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th ed.)*. Boston, MA: Pearson Education, Inc.

Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.

Erickson, F. (1986). Qualitative methods in research on teaching. In M. Wittrock (Ed.), *Handbook of research on teaching (3rd ed.)* (pp. 119-161). New York, NY: Macmillan.

Felix, U. (2005). What do meta-analyses tell us about CALL effectiveness? *ReCALL, 17*, 269–288. doi: 10.1017/S0958344005000923

Hayati, A., Jalilifar, A., & Mashhadi, A. (2013). Using Short Message Service (SMS) to teach English idioms to EFL students. *British Journal of Educational Technology, 44*, 66–81. doi:10.1111/j.1467-8535.2011.01260.x

Helman, L., Bear, D. R., Templeton, S., Invernizzi, M., & Johnston, F. (2012). Words their way with English learners: *Word study for phonics, vocabulary, and spelling* (2nd ed.) Boston, MA: Pearson Education, Inc.

Huang, C., & Lin, C. (2011). Enhancing classroom interactivity and engagement: CFL Learners' perceptions of the application of Web 2.0 technology. *British Journal of Educational Technology, 42*, E141–E144. doi:10.1111/j.1467-8535.2011.01219.x

Jacobs, H. H. (Ed.) (2010). *Curriculum 21: Essential education for a changing world*. Alexandria, VA.: ASCD.

Liu, M., Moore, Z., Graham, L., & Lee, S. (2002). A look at the research on computer-based technology use in second language learning: A review of the lit-

erature from 1990-2000. *Journal of Research on Technology in Education, 34*, 250-273.

Mechling, L. C., Gast, D. L., & Krupa, K. (2007). Impact of SMART Board technology: An investigation of sight word reading and observational learning. *Journal of Autism and Developmental Disorders, 37*, 1869–1882. doi 10.1007/s10803-007-0361-9

Page, M. S. (2002). Technology-enriched classrooms: Effects on students of low socioeconomic status. *Journal of Research on Technology in Education, 34*, 389-409.

Preston, C., & Mowbray, L. (2008). Use of SMART Boards for teaching, learning andassessment in kindergarten science. *Teaching Science, 54*(2), 50-53.

Puentedura, R. R. (2012). *The SAMR model: Background and exemplars* Retrieved from http://www.hippasus.com/rrpweblog/archives/2012/08/23/-SAMR_BackgroundExemplars.pdf

Russell, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use. *Journal of Teacher Education, 54*, 297-310. doi:10.1177/0022487103255985

The Partnership for 21st Century Skills (2011). *Framework for 21st Century Learning*. Retrieved from The Partnership for 21st Century Skills website: http://p21.org/storage/documents/1.__p21_framework_2-pager.pdf

Walqui, A. (2006). Scaffolding instruction for English language learners: A conceptual framework. *The International Journal of Bilingual Education and Bilingualism, 9*, 159-180. doi.org/10.1080/13670050608668639

Wang, S., & Vásquez, C. (2012). Web 2.0 and second language learning: What does the research tell us? *CALICO Journal, 29,* 412-430.

Zhao, Y. (2003). Recent developments in technology and language learning: A literature review and meta-analysis. *CALICO Journal, 21*, 7-27.

About the Author

Elena Andrei is an assistant professor of literacy with emphasis on English for Speakers of Other Languages (ESOL). Her previous work experiences include serving as an English as a foreign language teacher in her native Romania and as an ESOL teacher in North Carolina. Dr. Andrei teaches both literacy and ESOL certification classes. Her research interests are second language literacy, teacher education, and non-native English speaking teachers.