

MOBILE-ASSISTED NARRATIVE WRITING PRACTICE FOR YOUNG ENGLISH LANGUAGE LEARNERS FROM A FUNDS OF KNOWLEDGE APPROACH

Yan Chen, Northern Illinois University

Chris Liska Carger, Northern Illinois University

Thomas J. Smith, Northern Illinois University

As a nation of immigrants with diverse cultures and nationalities, one of the most striking occurrences in the United States educational system is the rapidly increasing enrollment of English Language Learners (ELLs). In view of their multicultural backgrounds, the multiliteracies education of ELLs is intertwined with their diverse socioeconomic, cultural, linguistic, and ethnic backgrounds, as well as their technological experiences. This 4-week research implemented an instrumental case study approach using funds of knowledge (FoK; see González, Moll, & Amanti, 2005) to explore the learning effects of scaffolding young ELLs' narrative writing skills through the use of tablet computers (iPads) and a digital handwriting app (Penultimate). Research findings showed that ELLs' learning motivation and quality of narrative writing abilities were enhanced through the use of this mobile technology. The culture-based writing topics based on FoK mirrored the ELLs' multicultural backgrounds and provided ELL teachers a creative way to incorporate students' prior knowledge into their English as second language learning through a culture-based instructional model. Parents also played a potential role in young ELLs' mobile-assisted language learning. Future studies should be directed toward extending multiliteracies curricula through FoK to actively engage ELLs in narrative writing activities through the use of emerging mobile technology.

Language(s) Learned in this Study: English

Keywords: Mobile Learning, Language Teaching Methodology, Writing

APA Citation: Chen, Y., Carger, C. L., & Smith, T. J. (2017). Mobile-assisted narrative writing practice for young English language learners from a funds of knowledge approach. *Language Learning & Technology*, 21(1), 28–41. Retrieved from <http://llt.msu.edu/issues/february2017/chencargersmith.pdf>

Received: June 1, 2016; **Accepted:** August 12, 2016; **Published:** February 1, 2017

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INTRODUCTION

The rapidly increasing enrollment of English Language Learners (ELLs) is becoming one of the most striking phenomena in the educational system of the United States. These ELLs reflect a wide variety of cultural backgrounds, ethnicities, and ages. ELLs attending schools vary widely in native languages, with more than 400 spoken languages represented among this population. During the 2012–13 school year, 9.2% of students enrolled in the public school system nationwide were ELLs (an estimated 4.4 million), which was higher than the 8.7% in 2002–03 (National Center for Education Statistics, 2016). The most common languages in 2013–14 included Spanish, Arabic, Chinese, Vietnamese, and Haitian or Haitian Creole (National Clearinghouse for English Language Acquisition, 2015). Most ELLs were from recent immigrant families or were born in the United States to immigrant families. ELLs are a highly heterogeneous group of students with diverse gifts, educational needs, educational backgrounds, and learning objectives (National Council of Teachers of English, 2008). They have brought a wide range of

educational and academic experiences and have reshaped the terrain of multiliteracies education with their diverse socioeconomic, cultural, linguistic, and ethnic backgrounds as well as their technological experiences.

Taking note of this ongoing shift and drawing on the perspective of postmodern educational philosophy, Taylor, Bernhard, Garg, and Cummins (2008) suggested a new approach to studying the impact of social and educational theory on current literacy practices for ELLs' multiliteracies education. This approach incorporated newly emerging information, communication, multimedia pedagogies, and culturally specific literacy resources.

Among the four macro-skills of listening, speaking, reading, and writing, learning to write in a second language has become one of the most urgent issues in ELLs' educational practice due to its complexity and recursiveness. ELLs' writing ability in English is critical for future academic performance and career development. However, Cloud, Genesee, and Hamayan (2009) stated that writing is the least-developed English language skill among ELLs. ELLs' scores on national writing assessment were much lower than non-ELL peers (Maxwell, 2012). Samway (2006) posited four deficits for ELLs: "they can't write; they have writing problems; they are reluctant writers; [and] they need to be taught the skills of writing before being asked to write independently" (p. vii). Samway's study also exposed several obstacles to the development of ELLs' writing skills, including language barriers, writing motivation, and appropriate teaching strategies and curriculum design.

While acknowledging the writing skill deficits of ELLs, Newman (2012) argued that all students have something to write about in the classroom:

Students' Funds of Knowledge serve as a vast treasure trove of writing possibilities for writers of all ages—and of all backgrounds. Teaching strategies, such as well-chosen mentor texts, all-inclusive language enrichment activities, and lessons in generative writing, help adolescents find their voices, share their stories, and participate meaningfully and successfully in our increasingly culturally diverse classroom. (p. 25)

A teaching framework based on funds of knowledge (FoK) is about "using students' knowledge and prior experiences as a scaffold for new learning" (González, Moll, & Amanti, 2005, p.135). It provides students with opportunities to choose writing topics on their own (Street, 2005). Hedges, Cullen, and Jordan (2011) proposed using FoK as a conceptual framework to improve curriculum in the early years. These studies identify insightful approaches to extend multiliteracies curriculum design through the perspective of FoK and to motivate ELLs to engage themselves in writing activities.

To facilitate the development of ELLs' multiliteracies education, previous studies have attempted to integrate various instructional technologies—from computer-assisted language learning (CALL) to mobile-assisted language learning (MALL). The flexibility that MALL offers to the learner has expanded the possibilities for CALL, and the use of MALL has the potential to exceed that of non-mobile CALL (Ballance, 2012). However, previous research involving MALL and ELLs' multiliteracies education has been limited at the methodological, pedagogical, and technology-facilitating levels.

At the methodological level, overviews of MALL studies (e.g., Burston, 2013; Kukulska-Hulme & Shield, 2008; Miangah & Nezarat, 2012) have substantiated that most have utilized college students or adult learners as participants (Oberg & Daniels, 2013; Stockwell, 2010), while studies in K–12 settings have been quite rare (Lan, Sun, & Chang, 2013; Nah, White, & Sussex, 2008). Among 345 MALL implementation studies included in an annotated bibliography from 1994 to 2012 (Burston, 2013), less than 16% were related to the K–12 settings, even though learning through mobile technology is rapidly expanding at all school levels. It is important to address the gap between the number of MALL studies in higher education versus the number carried out in K–12 settings, and it is also important that the research literature be enhanced through the inclusion of empirically-based studies.

At the pedagogical level, MALL has facilitated the language teaching–learning process in specific language skills such as listening (Liu, 2009), speaking (Kiernan & Aizawa, 2004), reading (Sung, Chang, & Huang, 2008), phrasing (Morita, 2003), vocabulary (Lu, 2008), spelling (Kemp & Bushnell, 2011), grammar (Moreira & Gomez, 2011), and phonological awareness (Plester & Wood, 2009). However, innovative pedagogy grounded in culturally and linguistically inclusive approaches to curriculum design also is needed (Taylor et al., 2008), particularly for developing ELLs’ writing skills (Miller & McCardle, 2011). FoK might provide a framework for developing such innovative pedagogies for this population, particularly for teaching narrative writing, which is recognized as the most suitable genre to teach in the classroom because of its versatility (Gutiérrez, Puello, & Galvis, 2015).

At the level of technology facilitation, a technology-integrated language-learning map for ELLs’ writing development has evolved from traditional computers (Foulger & Jimenez-Silva, 2007), to Web 2.0 tools (Woo, Chu, Ho, & Li, 2011), to mobile-based technologies (Billings & Mathison, 2012). Mobile phones (Sandberg, Maris, & Geus, 2011), PDAs (Hwang, Chen, Shadiev, Huang, & Chen, 2014), iPods (Billings & Mathison, 2012), netbooks (Lin & Wu, 2010), and the prototype of a mobile application (Kanala, Nousiainen, & Kankaanranta, 2013) each have been used in developing students’ writing skills individually or with other language skills. To date, there is a lack of research into the use of tablet computers (e.g., iPads) and mobile apps to facilitate ELLs’ multiliteracies development.

Therefore, to address the gaps in existing MALL research, the present study took a qualitative *instrumental case study* approach (Stake, 1995) based on the conceptual framework of FoK (González et al., 2005) to explore the learning effects of scaffolding young ELLs’ narrative writing skills through the use of tablet computers (iPads) and a digital writing app (Penultimate). The research questions addressed in this study were as follows:

1. How does the use of a tablet computer (iPad) and a digital writing app (Penultimate) facilitate the development of young ELLs’ narrative writing skills?
2. How do the FoK of young ELLs facilitate the development of their narrative writing skills when using a tablet computer (iPad) and a digital writing app (Penultimate)?

THEORETICAL FRAMEWORK

Conceptually grounded in Vygotsky’s theories in cultural-historical psychology, FoK provide a platform for bilingual teachers to acquire more information about their students’ prior knowledge, experiences, and cultural backgrounds (Petroni, 2013; Wei, 2014). Using a big picture perspective of the culture of human activities, González et al. (2005) elaborated on the hybridity of FoK through an ethnographical view. González et al. contended that culture can be divided into mentalist and materialist segments. It can also be viewed as systems of ideas, structural systems, and systems of knowledge. Those vivid perspectives of *culture* motivated anthropologists to explain educational achievement disparities among various student groups. FoK can be viewed as a set of cultural patterns that hide in the lived experiences of students. Teachers are expected to be researchers and should take a processual approach to look beyond the school boundaries—in particular, by examining the households and communities of poor and minoritized students—and to assess the impact of these contexts on students’ schooling. The cultural disparity of different student groups should exist not as a problem but rather as a catalyst for teachers to construct a panorama for student learning from the perspective of FoK.

Prior research about FoK has been conducted in Spanish and teaching mathematics (González et al., 2005), learning science (Barton & Tan, 2009), teaching ethics (Sugarman, 2010), creating literacy plans (Johnson, 2004), and being integrated into writing classrooms (Schwartz, 2015). Using a case study methodology, Larrotta and Serrano (2012) discussed adult learners’ FoK in English learning. McLaughlin and Barton (2013) explored pre-service teachers’ use of students’ FoK in science learning. Fox-Turnbull’s (2012) research identified the potential application of using FoK in technology education. Students in the

digital world can bring rich technological knowledge acquired from home and community to their formal technology education. This knowledge can then support them and contribute to their understanding as they collaboratively develop technological outcomes. Concomitantly, FoK pertaining to ELLs' diverse linguistic and cultural capital should be advocated as resources to enrich ELLs' multiliteracies development, although these FoK have often been ignored (Taylor et al., 2008). ELLs have particular ways of forming sentences and discourse to create meaning in their native languages. FoK—the skills and know-how that exist in a family and community—have the potential to provide engaging writing topics that can facilitate the growth of ELLs' multiliteracies development.

METHOD

By connecting FoK to young ELLs' narrative writing practices, this MALL study employed an instrumental case study as the inquiry strategy. Based on Stake (1995), the instrumental case study was used to address the need to generate a “general understanding and get an insight into the question by studying a particular case” (p. 3) and “serve[d] to help us understand phenomena or relationships within it” (p. 77). This study explored how this MALL study assists the development of young ELLs' narrative writing skills using an iPad and Penultimate based on their FoK.

PARTICIPANTS

Five ELLs (2 boys and 3 girls, ages 9–13) from four ELL families participated in this 4-week mobile-assisted narrative writing project through random selection. The five ELLs included three US citizens with Mexican heritage (Mexican-American), one US citizen with Chinese heritage (Chinese-American), and one Chinese citizen from a short-term (one year) visiting Chinese family in the United States. The participants were enrolled in a local school district's ELL program in the Midwestern United States.

DATA COLLECTION

The trustworthiness of the data collection was verified by triangulation of the home-visits, interviews, questionnaires, pre- and post-essays, informal observations, and field notes. The specific data process mainly included three stages:

Stage 1. Before the narrative writing practice, each ELL's family was provided with a home-visit and interview so that their FoK could be ascertained. To facilitate the home-visits, the ELLs and their parents were each asked 20 questions. These queries were primarily focused on the age, educational background, and educational goals of both the students and parents; the parents' occupations and interests; the neighborhood where the family resided; family activities and after-school activities (e.g., watching movies, television, or reading books); artifacts used at home; family social and cooperative practices; and opinions on technology use at home. The FoK writing topics were finalized for each ELL through this stage.

Stage 2. During the narrative writing practice, the participating ELLs completed one pre-essay using pen and paper. One week later, an iPad2 and Penultimate (a free digital writing app) were used as scaffolding tools in the post-writing activities. The interactive functions (inserting images; changing the background, the color, and the size of the font; and drawing) were emphasized during the project.

Stage 3. After the writing activities, the ELLs were interviewed informally for 15 minutes to share their reflections about participating in the study. The collected pre- and post-essays were graded using the IMAGE Writing Summary Rubric (Illinois State Board of Education, 1999).

DATA ANALYSIS OF TWO CHOSEN REPRESENTATIVE CASES

Among the five participants, two ELLs (a 14-year-old girl from a visiting Chinese family and a 13-year-

old boy from a Mexican-American family) were selected to represent the data analysis because both of the ELLs were seventh-graders.

Case 1. Liliana: An ELL from a Visiting Chinese Family in the United States

Liliana (pseudonym) was the daughter of a Chinese visiting scholar at a state university in the Midwestern United States. By the date of the present study, Liliana had lived in the United States for five months. Well-educated in China at a graduate level, Liliana's parents held high expectations for Liliana to improve her English skills incrementally and study abroad after completing her college education in China. As an ELL in the school, Liliana was interested in learning English, but she was shy and reticent. Liliana's drawing received several awards at school. Liliana had owned and used an iPad for more than a year prior to the study (See [Figure 1](#)).

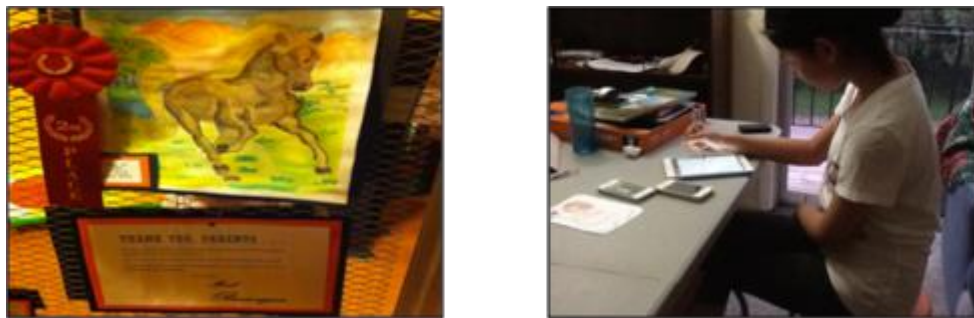


Figure 1. An example of a drawing award won by Liliana (left) and Liliana playing at home with her iPad (right).

Case 2. Larry: An ELL from a Mexican-American Family in the United States

Larry (pseudonym) was a seventh-grade ELL. He named himself “Larry” in the present study because of a famous American television character, Larry the Cable Guy. Larry is from a Mexican family. Larry's family came to the United States 17 years ago and began making a living in construction. Larry's father speaks English very well, but his mother speaks English poorly. There is no Internet in Larry's home. Larry and his sister do not have their own mobile devices. Larry is good at math and hopes to work in construction when he grows up. The family speaks both Spanish and English.

Data Coding

Based on the categorization of Hedges et al. (2011), the home-visit field notes were coded to ascertain ELLs' FoK for the mobile assisted writing topics (See [Table 1](#)). ELLs' writing essays were evaluated using adapted IMAGE Writing Summary rubric dimensions: (a) *language production*; (b) *focus*; (c) *support/elaboration*; (d) *organization*; and (e) *mechanics*, along with six levels of a continuum. The language production dimension reflected the second language acquisition process, while the other dimensions reflect the state writing rubric (Illinois State Board of Education, 1999).

Table 1. FoK Analysis for Liliana and Larry

Categories	ELL1: Liliana	ELL2: Larry
Family-based FoK	<p>Parents were well educated and both had doctoral degrees from China.</p> <p>Parents had academic jobs in China and a good salary.</p> <p>Parents had studied English formally for years.</p> <p>Liliana's mom, who lived with her in the United States, was good at reading literature and doing research but had difficulties communicating in the United States.</p> <p>Both Chinese and English were spoken at home, but mainly English.</p>	<p>Parents were educated with a high school diploma.</p> <p>Father worked in construction. Mom had no formal job.</p> <p>Father spoke English, while his mother spoke little English.</p> <p>Both Spanish and English were spoken at home, but mainly Spanish.</p> <p>Family was Catholic.</p>
Center-based FoK	<p>A white bulletin board was prepared on the refrigerator for Liliana's to-do list every day.</p> <p>English word cards from her teachers were used every day.</p> <p>Extra exercise sheets from the Internet were downloaded for practicing.</p> <p>Chinese storybooks (in English) were borrowed from the library.</p>	<p>A few literacy books in English and Spanish from the church were randomly kept.</p> <p>An English-Spanish dictionary was bought by his parents as a birthday gift.</p> <p>A few pieces of English newspaper from the community were randomly kept.</p> <p>An old calendar was randomly kept.</p>
Community-based FoK	<p>Liliana went to school with her mom.</p> <p>Liliana and her mom went to church on Sundays to practice English and make American Friends.</p> <p>Liliana and her mom went to a weekly International Café at the University to practice English and make American friends.</p> <p>Liliana and her mom went to the library to study for one to two hours every day.</p> <p>Liliana and her mom went to the mall for shopping sometimes.</p> <p>Liliana liked going to restaurants, especially for fried chicken on Tuesdays.</p> <p>Liliana and her mom traveled around the United States during breaks.</p>	<p>Larry walked to school with his classmates from Mexican-American families.</p> <p>Larry went to church in a Mexican-American community on Sundays.</p> <p>Larry and his family went to the movie theater one in a while.</p> <p>Larry liked going to restaurants for Mexican foods.</p> <p>Larry enjoyed working, such mowing the yard or helping with his father's construction work, in the neighborhood for money during break times.</p> <p>Larry and his family travelled to Mexico to meet their relatives every two or three years.</p>

Technology-based FoK	<p>Liliana’s mom used a laptop to keep in touch with Liliana’s father in China, school, and updated news.</p> <p>Liliana played language games such as Starfall and PBS on the laptop for 20–30 minutes every day.</p> <p>Liliana had her own iPad and iPhone.</p>	<p>Larry and his sister shared one laptop at home. They used it for homework and off-line computer games because there was no Internet connection at home.</p>
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FINDINGS

FoK Writing Topics

Throughout the present study, the ELLs’ FoK played active roles in developing their narrative writing skills. Specifically, the writing topics emerged from the ELLs’ family-based and community-based FoK and provided the ELLs with guidance about what to write. The center-based FoK, such as the literacy resources at home, encouraged the ELLs to overcome their learning barrier to demonstrate that they indeed could write. The technological-based FoK, such as computer- or language-game playing, enabled the ELLs to become accustomed to the Penultimate app quickly and transformed them from reluctant writers to active writers. The ELLs were not afraid of using emerging mobile technology, but showed great intrinsic motivation in writing with English independently.

Within the two chosen cases, the information obtained during the home-visit revealed that one of the unique aspects of Liliana’s FoK was her travel experiences in China. Thus, Liliana was encouraged to write an essay about her travels in China using the Penultimate app. Larry worked in the neighborhood in the summer, mowing the yard and cleaning up the trash every week. Therefore, a writing topic of *mowing in the backyard* was chosen for Larry.

When asked about writing the story of her travels in China, Liliana expressed interest in participating in a mobile-assisted cross-cultural writing community to share her culture, study, and life experiences with other ELL students from different cultures. Liliana stated, “it is really interesting because we can learn from each other... for example, history and culture from different countries. We will have more opportunities to talk with each other.” Larry thought that it was easy to write about his mowing experience. Although he did not write well, he believed he could if he had a better language arts teacher.

Development of Narrative Writing Skills

By comparing the ELLs’ pre- and post- essays, the language production, support/elaboration, and organization dimensions showed great improvement; while the focus dimension remained the same.

In Liliana’s case, she spent two hours on her 124-word pre-essay to describe her travel experiences in China. It was difficult and she did not know what to write. During the post-essay, Liliana’s writing motivation greatly improved with the intervention of the iPad and the Penultimate app. While waiting at the airport for her trip, she completed and submitted her five-page post-writing in less than one hour through her iPad, which enabled her to complete this mobile assisted learning activity of writing at any time at home or during her travels. By comparing the pre- and post-essays, the language production and support/elaboration dimensions showed great improvement (See [Figure 2](#)).

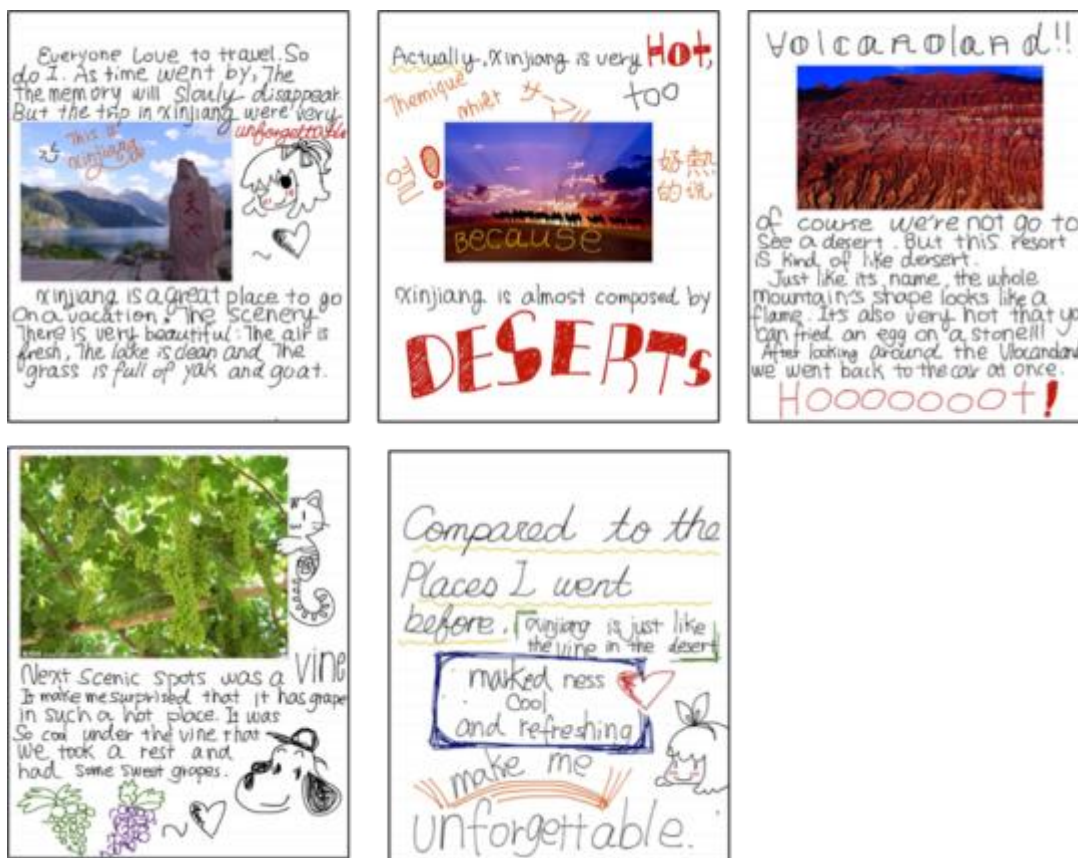


Figure 2. Samples from Liliana's post-essays.

In Larry's case, he completed the pre-essay writing after mowing the backyard. He wrote less than 40 words for the entire story and only used bullets. For the post-essay, Larry was surprised to be able to write his story on an iPad. While the researchers demonstrated the Penultimate app to him, Larry did not say anything, but he did focus on the app. He learned to use the app quickly and rewrote his story. He did not use bullets in the post-essay, which demonstrated an improvement in organization and mechanics according to the IMAGE Writing Rubric. He also kept saying "Wow, I don't even need an eraser." "May I change a different color?" At the end of the writing, he asked, "May I draw myself?" It was a big surprise because he never said anything about his interest in drawing before (See Figure 3).



Figure 3. Samples from Larry's post-essay.

Using an iPad and the Penultimate App

The two chosen ELLs showed great interest in writing using the iPads and the Penultimate app. Liliana preferred the post-essay, as she felt finishing the pre-essay was a heavy task. However, when using the iPad and the Penultimate app, Liliana thought the post-essay activity was more fun,

I can insert pictures. I can draw. I added more feelings in my story. I want to write more than last time. I feel I am making progress...I do like the e-paper background options to write my story. If possible, I would add some music to my story next time because the paper is like a staff...I would also use iPads to learn Chinese and Mathematics.

Liliana stated that she used the online dictionary to look up new vocabulary and Evernote to refer to her previous notes. However, Liliana pointed out that “the stylus is not natural sometimes. If my fingers touch the iPad screen accidentally, it will affect the story writing... My mom does not allow me use iPad for a long time because she is worrying about my eyesight.”

When asked about his reflection, Larry said:

I really love writing with iPad. It can save money for buying notebooks and pencils. I don't even need to buy erasers any more...I can search more pictures online by using iPads. It will be helpful to remind me about what to write in my story...I want to have my own iPad. Many of my classmates have one, although we are not allowed to use at school.

ESTABLISHING TRUSTWORTHINESS OF QUALITATIVE DATA

Triangulation was achieved through the in-depth interviews during the home-visits, ELLs' pre- and post-essays, reflections, and informal observations to “see if what we are observing and reporting carries the same meaning when found under different circumstances” (Stake, 1995, p. 113). Additionally, member checking was used to triangulate the researchers' observations and interpretations with the facilitation of the collaborators.

DISCUSSION

These research findings demonstrate that ELLs are willing to incorporate mobile technology into their second language learning through writing because of their English writing deficiency. Young ELLs are accustomed to having technology in their daily lives and they are quick learners. ELLs' curiosity can be satisfied with the instant, attractive, and lifelike audio, video, images, and animations provided by apps like Penultimate. Mobile devices provide ELLs with an effective way to improve their writing ability, which is essential to their future academic performance and career development. ELLs' learning motivation as well as the quality of their narrative writing abilities were enhanced through the use of mobile technology. The ELL teacher in the school district said the following:

Most of them [ELLs] are good at conversational English but they still make a lot of grammar errors. I don't have any real strong writers. Most of the kids are still in the ELL program because of writing because usually they pass the listening and speaking test by now and some of them have passed the reading test by now but it's still the writing test that is keeping them in the program. The use of iPad and penultimate motivated them to keep writing.

The sample size was too limited to generalize the research findings. However, the chosen instrumental case study represented two unique ELL groups. Particularly, Spanish and Chinese are among the top-five common languages in the U.S. public schools (National Clearinghouse for English Language Acquisition, 2015). The research findings are instrumental not only to understanding these two ELLs' mobile-assisted

writing activities, but also to delineating a generic picture to demonstrate how using FoK can facilitate young ELLs' language development through mobile writing. The ELL teacher mentioned the following:

A lot of their [ELLs] funds of knowledge are things related to outside of the school and a lot of it doesn't involve reading and writing. I know it can be more interesting to them when we are reading or writing about something that they know about, and if we're reading and writing about something that they have no idea about, I know it's a lot harder for them.

The culturally-embedded writing topics based on FoK could mirror the ELLs' multicultural backgrounds and provide ELL teachers with a creative approach to incorporate ELLs' prior knowledge into their multiliteracies education. The findings concurred with Franquiz and Brochin-Ceballos (2009), who advocated that ELL teachers should incorporate their students' cultural backgrounds into the classroom, foster cultural preservation through engagement with culture-based activities, and encourage students to speak and write about their culture, values, and beliefs. These findings also provided constructive insights into the deficit views about ELLs' writing discussed by Samway (2006)—namely, that ELLs are able to perform effective writing through the scaffolding of FoK. Based on the findings, a mobile-assisted FoK narrative writing instructional model (shown in Figure 4) was proposed to encourage ELLs to share their household culture through digital writing in English through five steps (discovering, connecting, writing, sharing, and preserving culture) from four aspects (family-based, center-based, community-based, and technology-based FoK). The ELL teacher also showed great interest in applying this mobile-assisted FoK narrative writing model for ELLs to practice their narrative writing skills as well as share their FoK-based experiences with students from other groups.

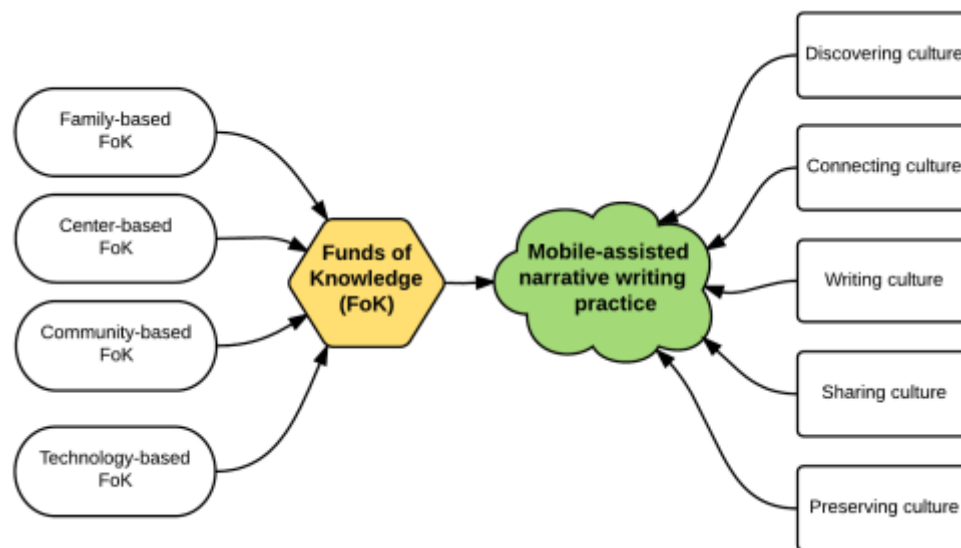


Figure 4. A mobile-assisted FoK narrative writing instructional model.

Improving technology literacy has been an important educational aim for 21st century students, particularly ELLs. Schools, teachers, and even parents should make effective use of FoK to facilitate ELLs' formal learning through emergent mobile technology. Major advances in understanding of ELLs' writing skills can best be facilitated by learning through mobile technology and the integration of FoK. Potential advantages and disadvantages of alternative writing apps should be explored and assessed for their capacity to facilitate development of ELLs' writing skills.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the support of the 2015 Spring Research Grant from Golden Key International Honour Society and Gail Jacky, director of the University Writing Center at Northern Illinois University, for editing the manuscript, without which the present study could not have been completed.

ABOUT THE AUTHORS

Yan Chen is a Doctoral Candidate of Department of Educational Technology, Research, and Assessment at Northern Illinois University. Her research interests focus on technology integration in second language acquisition and multicultural and multiliteracies education.

E-mail: ychen@niu.edu

Chris Liska Carger was a Professor of Department of Literacy and Elementary Education at Northern Illinois University. Her research interests focused on narrative inquiry, ethnography, and multicultural education.

Thomas J. Smith is a Professor of Educational Research and Evaluation at Northern Illinois University. His research interests focus on quantitative research methodology and large-scale data analysis.

E-mail: tjsmith@niu.edu

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