Evaluating a novel CALL tool for the development of oracy and academic language in young English language learners

Nick Feroce[1], Jenny Liu[2], and Rajendra Chattergoon[3]

Abstract. This study examines the relationship between English language proficiency outcomes and the use of a Computer-Assisted Language Learning (CALL) tool that is designed to strengthen the academic English and oral proficiency skills of young English Learners (ELs). We compare scores on a standardized English language proficiency assessment for 2,034 ELs from kindergarten through Grade 5 in the US who either used the CALL tool during the 2020-2021 academic school year (n=1,478) or did not (n=556). Descriptive analyses show larger scores for students who used the program than those who did not, and this was seen across student demographic subgroups. Statistical analyses reveal that this difference is significant even when accounting for student demographics and enrolled school and that greater program use is related to higher proficiency scores. The largest effects are seen for oral proficiency scores. The study raises implications for use of CALL tools in contexts where English is the language of education.

Keywords: academic English, young language learners, oracy, oral proficiency.

1.   Introduction

Within the US, children learning English as a second language readily acquire the social oral language used in informal contexts (e.g. with friends), but often do not acquire the language proficiency skills needed for success in content-area classes (Menken, Kleyn, & Chae, 2012). This 'academic English' is a formal register of

1. Lexia Learning, Concord, MA, United States; nick.feroce@lexialearning.com
2. Lexia Learning, Concord, MA, United States; jenny.liu@lexialearning.com
3. Lexia Learning, Concord, MA, United States; rajendra.chattergoon@lexialearning.com

standard English and is integral for helping students interact in the classroom and successfully obtain and make use of subject matter information (Scarcella, 2003; Valdés, 2004). Furthermore, many ELs receive services that are not appropriate for their English proficiency level (Menken et al., 2012) and which often do not emphasize oral language skills (*oracy*, NASEM, 2017).

CALL tools may help effectively address the academic language needs of ELs. To this extent, Lexia® English Language Development™ (Lexia English) was developed and released in 2020. Lexia English is a blended learning program for ELs in kindergarten through Grade 6 (K-6), and consists of an online computer program, teacher-led lessons, and student progress-monitoring data. The program consists primarily of speaking and listening activities, which utilize academic content (science, math, social studies, general knowledge) and are framed as simple, scripted conversations with program characters. An example is shown in Figure 1.

Figure 1.   Example program image

The program is grounded in various theories of second language acquisition. Comprehensible input (Krashen, 1982) is presented via language frames, and an auto-placement tool places users at an appropriately challenging level. A speech recognition engine attuned to various English accents allows for users to practice speaking (Output Hypothesis; Swain, 1995), while corrective feedback is provided explicitly to learners (Interaction Hypothesis; Long, 1996). Furthermore, an adaptive program design provides students with explicit instruction and additional practice for activities they answer wrong twice in a row.

The aim of this study was to examine the impact of Lexia English on English language proficiency outcomes for students in Grades K-5. Our research questions were the following: Do students who use Lexia English score higher on standardized English language proficiency tests compared to their peers who do not use the program? How does the amount of program use impact English proficiency outcomes?

2.   Method

One school district in the US signed a data exchange agreement with Lexia to share demographic and assessment data for 2,034 EL students in Grades K-5 across 21 schools. English proficiency scores were from the 2021 English Language Proficiency Assessment for California (ELPAC, scores on vertical scale from 1,150-1,700 Grades K-2, 1,150-1,800 Grades 3-5) and included scores for the overall assessment and oral and written subdomains.

All district EL students had access to Lexia English during the 2020-2021 school year, however there was considerable variation in the amount of program units completed (*Range*=1-1,163, *M*=85, *SD*=119) due to pandemic-induced changes to remote and hybrid schooling environments. We considered program users to be students who completed at least one unit (three to five minutes).

We transformed student scores into grade-specific z-scores (interpreted as standard deviations, SDs) and statistically analyzed them using multiple linear regressions. We included 2021 ELPAC scores as the dependent variable, and dummy-coded predictor variables for L1 (Spanish, non-Spanish), gender (male, female), socioeconomic status (low SES, non-low SES), and enrolled school.

3.   Results and discussion

A summary of overall ELPAC scaled scores is shown in Table 1.

Table 1.   Mean (SD) ELPAC scores by group

	Program Users	Non-users
All participants	1,487 (70)	1,472 (109)
Gender		
Male (n=1,112)	1,486 (72)	1,463 (118)
Female (n=922)	1,488 (68)	1,484 (94)

SES		
Low SES (n=937)	1,471 (63)	1,449 (100)
Non-low SES (n=1,097)	1,502 (74)	1,487 (112)
L1 Group[*]		
Spanish (n=896)	1,467 (68)	1,447 (96)
Non-Spanish (n=1,138)	1,505 (68)	1,486 (113)

*Students spoke 50 different L1s, but we grouped this as a two-level variable for statistical power.

As seen in Table 1, ELPAC scores were higher for Lexia English users than non-Lexia English users, and this pattern is seen for all student demographic subgroups.

Figure 2.   Average ELPAC score by domain and standard error bars
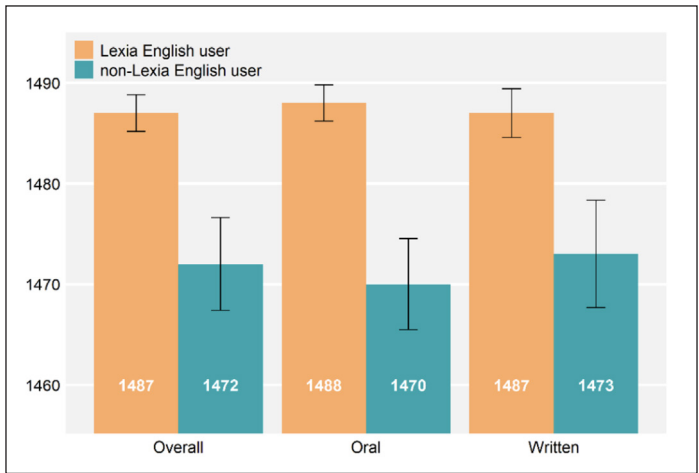
As seen in Figure 2, Lexia English users scored higher than non-Lexia English users in both the oral and written domains. Regression analyses confirmed these patterns: Lexia English users scored significantly higher than non-Lexia English users on the overall ($B=0.193$, $SE=.051$, $p<.001$; $R^2=0.192$, $p<.001$), oral ($B=0.219$, $SE=.052$, $p<.001$; $R^2=0.155$, $p<.001$), and written ELPAC ($B=0.149$, $SE=.051$, $p=.004$; $R^2=0.191$, $p<.001$). The largest effect was seen for the oral domain, in line with the program's focus.

We also examined just the Lexia English users and incorporated a predictor variable for the number of program units completed. This revealed that a greater number of program units completed was significantly related to higher scores on the overall ELPAC ($B=0.045$, $SE=.015$, $p=.003$; $R^2=0.112$, $p<.001$), such that completion of 22 units was associated with a one point scale score increase.

Overall, these results demonstrate how explicit language instruction and targeted oral language practice can be incorporated into CALL technology to support academic language and oracy development for young ELs. Many existing English language ed-tech tools are designed for the acquisition of reading and writing skills or for acquiring English in contexts where it is not the primary language of education (e.g. Bang, Olander, & Lenihan, 2020). Thus, this is a novel contribution toward applying CALL tools across different contexts. Additionally, the diverse sample may suggest that the positive findings could generalize the use of similar tools in contexts where English is the primary language of education and society.

The results corroborate positive findings seen for personalized learning affordances of adaptive learning systems (Slavuj, Meštrović, & Kovačić, 2017), and dedicated attention to speaking and listening activities in (system-guided) dialogue-based CALL systems (Bibauw, François, van den Noortgate, & Desmet, 2022). The program is not meant to replace real-life dialogue, but rather complements classroom instruction by providing ELs a low-anxiety environment to strengthen their English language skills via guided, self-paced interactions with program characters (see Bibauw et al., 2022). Finally, positive findings were seen for both written and oral domains, in line with research highlighting the importance of oral language skills in reading/writing (NASEM, 2017).

4.   Conclusions

This study shows early evidence that a CALL tool focused on oral language and academic English for young ELs may lead to higher English language proficiency, particularly as students complete a greater number of program units. We cannot claim that the program causes this as we did not control for students' prior year achievement scores (due to limited data availability). Additionally, it remains to be seen how educators' use of teacher-led lessons and student progress-monitoring data impacts student outcomes. Overall, the study serves as a promising first step toward understanding the efficacy of a new CALL tool.

References

Bang, H. J., Olander, K., & Lenihan, E. (2020). Testing a research-based digital learning tool: Chinese EFL children's linguistic development. *CALICO Journal, 37*(3), 277-308. https://doi.org/10.1558/cj.40544

Bibauw, S., François, T., Van den Noortgate, W., & Desmet, P. (2022). Dialogue systems for language learning: a meta-analysis. *Language Learning & Technology, 26*(1), 1-25.

Krashen, S. (1982). *Principles and practice in second language acquisition*. Pergamom.

Long, M. (1996). The role of the linguistic environment in second language acquisition. In W. C. Ritchie & T. K. Bhatia (Eds), *Handbook of second language acquisition* (pp. 413-468). Academic Press.

Menken, K., Kleyn, T., & Chae, N. (2012). Spotlight on "long-term English language learners": characteristics and prior schooling experiences of an invisible population. *International Multilingual Research Journal, 6*(2), 121-142. https://doi.org/10.1080/19313152.2012.665 822

NASEM. (2017). *Promoting the educational success of children and youth learning English: promising futures*. National Academies of Sciences, Engineering, and Medicine. National Academies Press.

Scarcella, R. (2003). *Academic English: a conceptual framework*. University of California Linguistic Minority Research Institute. https://escholarship.org/uc/item/6pd082d4

Slavuj, V., Meštrović, A., & Kovačić, B. (2017). Adaptivity in educational systems for language learning: a review. *Computer Assisted Language Learning, 30*(1-2), 64-90. https://doi.org/1 0.1080/09588221.2016.1242502

Swain, M. (1995). Three functions of output in second language learning. In G. Cook & B. Seidlhofer (Eds), *Principle and practice in applied linguistics: studies in honour of H.G. Widdowson* (pp. 125-144). Oxford University Press.

Valdés, G. (2004). Between support and marginalization: the development of academic language in linguistic minority children. *International Journal of Bilingual Education and Bilingualism, 7*(2-3), 102-132. https://doi.org/10.1080/13670050408667804

Intelligent CALL, granular systems and learner data: short papers from EUROCALL 2022
Edited by Birna Arnbjörnsdóttir, Branislav Bédi, Linda Bradley, Kolbrún Friðriksdóttir, Hólmfríður Garðarsdóttir, Sylvie Thouësny, and Matthew James Whelpton