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Research Article

Improving the Comprehension and Vocabulary Skills of English Language Learners With Content Integrated Language Instruction for Adults

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Abstract

We have developed a program called Content Integrated Language Instruction for Adults, incorporating research-based practices in vocabulary and language instruction to facilitate a deep and broad understanding of complex content. A subset of words critical to comprehension of the subject matter is covered in each lesson, using group discussion and extensive writing as well as utilizing contextual clues and doing morphological analysis. We have implemented this curriculum with two cohorts of English Language learners studying U.S. history and civics. There was significant growth in both vocabulary (for intentionally studied words, incidentally encountered words, morphologically complex words) and comprehension of the content.

Keywords: vocabulary, reading comprehension, academic content

According to the American Community Survey data, in 2017, there were 247 million adults living in the United States. Of those, 52 million or about 21.5% reported speaking a language other than English at home (U.S. Census, n.d.). For some of those individuals, limited English proficiency is a serious barrier, affecting their access to community resources, job prospects and in general, their participation in the society. Thus, the challenges faced by this group are not only a specific educational issue but also a broader social justice issue. Adult education classes in communities play an important role in removing this barrier. In fact, according to NCES (n.d.) data,

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in 2015, 1.5 million adults were enrolled in adult education programs in the United States. Of those, 46% were in English Language (EL) classes

In EL classes, the participants tend to have very different backgrounds. Some are recent immigrants with different levels of education and proficiency in their first language (L1). Some, especially Spanish speakers, who have been studied more systematically, are highly literate in their L1. However, their low literacy levels in English may overshadow their existing first language (L1) literacy background. Recent immigrants from South East Asia or East Africa who have escaped from war and lived in camps for many years are less likely to have formal education and do not have strong literacy skills in their L1 (Burt et al., 2003; Condelli et al., 2009; Purcell-Gates et al., 2002; Strucker & Davidson, 2003).

In addition to the diversity in their backgrounds, there is also wide variability in the learners' reasons for enrolling in EL classes, from basic survival needs (e.g., to get access to food, clothing, shelter, medical care) to needs such as employment (e.g., find a job or advance in a job) and participation in social and political institutions (e.g., further continue their education or become a citizen) (Graham & Walsh, 1996; National Research Council, 2012; Skilton-Sylvester, 2002).

These varied goals suggest that for EL learners, developing their language skills is a means to other ends. Since language learners need to understand complex information (on topics such as health, finance, civics, law, math and science), language instruction cannot be divorced from academic content. Thus, effective EL instruction programs need to integrate both language and content knowledge development and pave the way for learners' further educational and vocational efforts (Ewert, 2014). In this paper, our goal is to first describe how language instruction can be integrated seamlessly with specific content instruction to develop both vocabulary and comprehension proficiencies of adult EL learners, and then discuss the evaluation of this approach's effectiveness.

Literature Review

Language comprehension, especially reading comprehension, is a key proficiency that forms the foundation for all aspects of adult education, including preparation for post-secondary education, lifelong learning, workforce training, as well as EL development. Decades of research in cognitive and educational psychology suggest that to comprehend complex content, all learners (whether reading in their L1 or L2) need both a strong vocabulary and some background knowledge about the topic (Graves, 2006; Kintsch, 1998; McNamara et al., 2007; Perfetti & Hart, 2002; Van den Broek et al., 2005).

Vocabulary

When examining the literacy skills of native and nonnative speakers in adult education classes, it has been found that compared to their native-speaking peers, nonnative speakers performed well on decoding tasks. However, they struggled with vocabulary and reading comprehension (MacArthur et al., 2010; Nanda et al., 2010; Strucker et al., 2007).

Vocabulary is an essential component of oral and written language comprehension. Research shows that if the number of unknown words is increased in a text (by replacing the low frequency words with nonwords and making the rest of the words very high frequency), comprehension suffers (Hsueh-Chao & Nation, 2000). According to Grabe and Stoller's (2002) estimates, one needs at least 3,000 words to read independently in L2.

For academic texts, this number is considerably higher. Zareva et al. (2005) found that roughly 9,000 words are needed to comprehend a college-level academic text. However, not only the breadth but also the depth of vocabulary is related to reading comprehension. Perfetti and Hart's (2002) Lexical Quality Hypothesis states that a rich, stable and integrated word knowledge--including orthographic, phonological, syntactic and semantic components--facilitates word recognition and comprehension. In other words, knowing how a word is written, pronounced, and used in different contexts, as well as how it relates to other concepts, are all part of this integrated and rich lexical representation. For both native and nonnative speakers, high-quality lexical representations include different uses and nuances of a word, understanding where the word is appropriate and where it is not. One of us remembers a rude email written by a (native speaker) student who apologized for the "quaint email" he wrote. He did not realize that *quaint* has a connotation that is more than the dictionary meaning "unusual." Its meaning also includes the dimensions of attractiveness and old-fashionedness, neither of which, by the way, were present in his email.

Vocabulary instruction that aims to build rich lexical representations--which include the various components described above as well as explicitly teaching vocabulary--has been shown to produce significant improvement in word knowledge and comprehension for both monolinguals and EL learners (Carlo et al., 2004; Crosson et al., 2019). However, vocabulary develops not only through explicit teaching, but also incidentally, as words are encountered in books, media and conversations. Therefore, exposure both inside and outside of the classroom is essential. In addition, learners need to have some strategies for figuring out on their own, the meanings of the words that they encounter. There is also a reciprocal effect of comprehension on incidental vocabulary development. Better understanding of the text surrounding an unfamiliar word helps a learner to infer that unfamiliar word's meaning more easily (Pulido, 2004).

Studies with children and adolescents in formal schooling indicate that although oral communicative proficiency develops relatively rapidly, academic language requires several years of study because of its decontextualized nature, formal structure, and specialized vocabulary (Baumann & Graves, 2010; Nagy & Townsend, 2012; Schleppegrell, 2004). To use examples from our program discussed in this paper, academic language requires understanding concepts that may not be immediately present in one's everyday life (e. g., *Abraham Lincoln*); utilizes special connectives (e.g., *in order to*) and content-specific jargon (e.g., *legislative*) and includes many morphologically complex words (e.g., *disagreement*). Development of academic language has not been systematically investigated with adults, but it is reasonable to expect a pattern similar to that found with children. The majority of adult EL learners, especially if they were born in the United States, report having good speaking skills, but on NAAL tests, only about a third have scores showing literacy beyond basic levels (Wrigley et al., 2009), indicating struggles with academic language.

Background Knowledge

Decades of literacy research has shown that in addition to vocabulary, comprehension also involves the integration of textual information with the reader's pre-existing knowledge, beliefs, and opinions (Rapp et al., 2007). The more one knows about a topic, the better one comprehends the material (McNamara et al., 2007). For both

L1 and L2 speakers, comprehension of academic content is challenging because academic texts do not have the contextual and experiential support that accompanies everyday communication. New academic content may not be easily comprehended if there is not enough background knowledge to provide a framework in which to situate the new information. That is why for adults, background knowledge was shown to be a significant predictor for reading comprehension (Alamprese, 2009).

For EL learners, background knowledge also includes a cultural component. Lack of cultural knowledge has been shown to hamper reading and listening comprehension of young EL learners (for reviews, see Droop & Verhoeven, 1998; Lesaux et al., 2010). Studies with college students learning a second language also point to the importance of cultural knowledge (Brantmeier, 2005). Finally, as Zareva et al. (2008) noted, advanced EL learners had very rich semantic networks in English, but the networks were qualitatively different from those of native speakers. This indicates that cultural experiences shape how the word associations are created. These data highlight that cultural knowledge needs to be part of the discussions on understanding vocabulary proficiency.

Effective Practices

Research with monolingual and bilingual children have clearly identified the components of effective vocabulary and reading comprehension instruction for complex academic content. Given the existing research on the importance of vocabulary, background knowledge and comprehension of complex content, we developed a curriculum named Content Integrated Language Instruction for Adults (CILIA) to develop these skills of adult EL learners. The curriculum of CILIA was based on effective practices reported in empirical studies. It must be noted, however, that most of these effective practices have been discovered in studies with native and nonnative speakers in elementary or middle schools, or with college students in foreign language classrooms. As far as we know, there is a dearth of systematic interventions on vocabulary and comprehension of EL learners in adult education settings.

Research Questions

The goal of this paper is to discuss CILIA and present data to address these questions:

1. How does vocabulary and comprehension instruction that is fully integrated with academic content affect the learning of individual vocabulary items, as well as the understanding of the complex content?
2. How do students perceive such an approach?

The program was designed to facilitate EL learners' language development, within the specific content of American history and civics. This content enables the learners to participate more fully in the United States, including following a path to citizenship. In Study 1, we describe the first implementation and evaluation of the program. In Study 2, we describe the second implementation and evaluation of the program in which a control group was included.

Characteristics of CILIA

Even though their targeted learners may differ, effective vocabulary and content interventions have several common characteristics (Crosson et al., 2019; Crosson & Moore, 2017; Francis et al., 2006; Lesaux et al., 2010; Levesque et al., 2018; Marulis & Neuman, 2010; Nash & Snowling, 2006; Neuman & Wright, 2014; Pollard-Durodola et al., 2011; Roediger & Karpicke, 2006; Stahl, 2003; Silverman et al., 2014). Acknowledging the specialized nature of academic language and its interrelatedness with

content-area knowledge, we have incorporated the following characteristics of effective instructional programs into the design of CILIA:

1. Promoting a deep understanding of a relatively small number of critical words that are selected carefully and deliberately: In contrast to the usual practice of facilitating a basic familiarity with a large number of words, we have included high-utility words that are crucial to understanding history and civics (e.g., *domestic, judicial, approve, colony, representative, permit*….) and words that signal important relationships as connectives or action verbs (e.g., *make sure, such as, wide variety of*….)
2. Providing explicit instruction: Our goal was to facilitate a deep, multifaceted understanding of each word by providing definitions, L1 translations, relevant examples of usage from everyday life, and from different cultures represented in the classrooms.
3. Incorporating a variety of modalities: There were reading, writing, listening, speaking, as well as multimedia activities in instruction, and in assessments. The course was writing intensive as the learners wrote summaries of the texts before and after instruction (Study 1). Learners also completed various homework assignments expressing their thoughts on a topic (e.g., *How would history change if native Americans did not help the settlers?*)
4. Developing a rich knowledge network to facilitate connections among (a) prior knowledge, (b) new content knowledge and (c) the specific vocabulary: To accomplish this, before studying the texts and the targeted vocabulary items in them, first there was activation of prior knowledge and a discussion of the key concepts, using learners' existing knowledge (e.g., *What is a colony? Was your home country ever a colony?*). Then, in an iterative process, the new content was covered through readings, class discussions, exercises, and internet searches, followed by the study of the new vocabulary items within that conceptual framework. This new content, including the new vocabulary was, in return, integrated into learners' existing knowledge network, thus updating and possibly enriching this network. To give a concrete example, before learning the specific meaning of "*executive,*" the three branches of government were discussed, and this content provided the scaffold for the new vocabulary item. Through this process, the learners may initially understand the term within the familiar political system from their countries of origin. However, as the content describing the U.S. government is introduced, the definition of the term "executive" is now interpreted within the structures of different political systems.
5. Providing multiple exposures to the words in varied contexts: The goal was to provide opportunities to fine-tune a word's meaning, or its different meanings, by illustrating where and how it is used. (e.g., some words were deliberately included in two different texts, other words were used in various sentences (e.g., *executive* of a company vs *executive* branch in government or *human rights* versus *right and wrong*).
6. Providing the learners with the analytic tools and strategies to understand the roots of words and their different morphological forms (inflections, derivations): There was explicit discussion of vocabulary development strategies such as the analysis of common affixes (e.g., *in- dis- -ment, -er*) and the use of contextual clues to infer an unfamiliar word's meaning.

In addition, given the characteristics of adult EL learners, our program also included the following dimensions:

7. Encouraging collaborative work: Learners read sections of text together and answered questions in small groups to interact and learn from each other. This also developed camaraderie in the classroom and provided opportunities for social interaction, thus making the classroom a fun and supportive environment.
8. Using learners' first language and cultural experiences: The past experiences of adult learners were acknowledged and valued. The learners compared and contrasted the new American-based information with that from their country, which made the information more vivid and provided a framework to better retain and integrate the new knowledge (e.g., *Does your home country have a president? What are the responsibilities of that person? Is it similar/different to the case in the United States?*)
9. Conducting frequent pre- and post-reading assessments and self-checks: As recent studies show, frequent tests not only help the instructors to see how the students are doing but also provide another learning opportunity, hence there were frequent short quizzes.

Lesson Structure

The CILIA curriculum involved the deep analysis and comprehension of six civics-American history modules. Each module included the texts as listed below:

1. A small business; Neighborhoods in Philadelphia
2. Philadelphia history; Benjamin Franklin
3. The Three Branches of Government; State Governments
4. Jamestown and Plymouth; the Independence of the Colonies
5. A Nation Divided and a President Lost; the Expansion of the United States
6. Democracy and Constitutional Rights; Martin Luther King and the Civil Rights movement

The EL course lasted 3 months, with classes meeting twice a week for a total of 3 hours each week. Each of the six modules was covered across 2 weeks. In other words, the texts were divided into two logical parts (see above) and each week, one half of the material was covered. During each week of class, the texts were studied with vocabulary instruction integrated within the content of these texts. Each class period included the components of instruction listed below, but the components varied in duration depending on the content and the learning objectives for that particular day:

1. Reviewing the homework
2. Activating prior knowledge and the conceptual framework, before introducing the new passage
3. Teacher reading the new passage aloud
4. Students reading the passage aloud (in pairs)
5. Pre-checking the understanding of the text by asking learners to write a summary
6. Explicit vocabulary study – reviewing the conceptual framework, and analyzing the pre-selected critical vocabulary items in the passage from multiple angles: considering the explicit meaning of the vocabulary item and noting its use within the text; analyzing its morphological structure and generating other related items, situating the vocabulary item within the overall conceptual framework and "updating" the learners' mental representation of the text

7. Students rereading the text silently on their own
8. Post-checking the understanding by asking learners to write a second summary of the text
9. Assigning homework to encourage deep comprehension of the passage, and the application of the new vocabulary items

A more detailed discussion of word selection strategies and specific classroom activities are presented in Sagar et al. (2015).

Study 1

In Study 1, we report the results of the first implementation and evaluation of CILIA.

Participants

There were complete data from 26 learners in three classrooms. These adults came from 17 countries across the world. With two exceptions, all had at least a high school education in their native country, although the quality of the education may not have been consistently high. They were newcomers to the United States and self-reported low to medium levels of English proficiency. Some had home languages (e.g., Spanish, French) that were more similar to English than others (e.g., Wolof, Arabic, Chinese). Their ages ranged from 19-68, with 10 learners younger than 30, 12 learners aged between 31-59, and one learner aged 68.

Materials

The following tasks were used to evaluate the program:

1. **Vocabulary test:** The same vocabulary test was given at the beginning and the end of the course, with an interval of three months. The test had 60 multiple choice questions, and included three types of items:
    a. Intentional = 38 words that were in the texts and were explicitly studied in the classroom
    b. Incidental =12 words across the modules, that were encountered but not explicitly discussed in the classroom
    c. Morphological = 10 words that were derivations from a given root word using the suffixes discussed in the classroom
2. **Quizzes:** After every two modules, a quiz was given to test the vocabulary and content of those units, for a total of 3 quizzes. [An example is given in Appendix A.] In each quiz, the vocabulary component consisted of a cloze task, a paragraph with 10 words missing. The goal was to see how the words were used in a meaningful connected text. A word bank of 12 words was provided at the bottom so that the participants could select the appropriate word from that list to fill in the blank. The vocabulary test was scored leniently. For example, the accuracy of inflections was not considered. In some instances, another word could fit the blank and that was accepted, but of course that meant another blank could not be filled. The content section of the quizzes asked very specific questions on the material that was studied. The vocabulary sections in all quizzes had a maximum score of 10. For content sections, the maximum scores were 10, 14, 16, for the first second and third quizzes, respectively.
3. **Student evaluations of the program.** At the end of the program students filled an anonymous survey which asked about their views on the strengths and weaknesses of the program. The first four questions asked them to provide a rating from 1-5 on different aspects of the program. The remaining short answer questions asked about their favorite

story, what activities we should keep, which we should eliminate and any thoughts and ideas they wanted to share.

Results

Table 1 summarizes pretest and posttest accuracy scores on the vocabulary test. The accuracy was defined as proportion correct. [The intentional items had 37 as the maximum possible score, because there was one incorrect item on the test, and that was omitted from the analyses]. The pre- and post-test scores were compared using t-tests, with alpha levels corrected for four comparisons (alpha used =.05/4=.013). Despite the short instruction duration and the heterogeneous learner backgrounds, the analyses indicated significant growth in all three categories of vocabulary items, as well as in the total score. The test scores as well as the t-test values are given in Table 1.

Table 1: Proportion of correct responses, means (standard deviations), t-test values of the different types of vocabulary pre- and post-test items in Study 1

	PRETEST	POSTTEST	t-test , df=25
Intentional words	.60 (.19)	.71 (.18)	5.45*
Incidental words	.69 (.22)	.80 (.19)	4.37*
Morphological analysis	.55 (.31)	.71 (.25)	3.14*
Total	.62 (.19)	.72 (.190	6.52*

**P<.013*

As summarized in Table 2, quizzes represent a measure of what the learners retained about the material covered in class, both the intentionally studied words and the content. The vocabulary section of Quiz 1 was not scored, because one class had the quiz without the word bank given. Quizzes 2 and 3 were scored. Overall, the vocabulary sections indicated 66% and 81% correct performance, indicating that the majority of the words were now familiar to the learners. On the three content sections, the performance ranged from 57% -77%. Overall, the learners reached average/high average levels of performance and there was a wide variety in the scores.

Table 2: Percent correct on the quizzes in Study 1

	n	mean	sd
Quiz 2 Vocabulary	23	66.1	22.9
Quiz 3 Vocabulary	22	80.9	20.9
Quiz 1 Content	23	57.0	24.2
Quiz 2 Content	22	77.9	24.7
Quiz 3 Content	14	75.0	13.6

n = number of learners

Across the 24 anonymous evaluations, the response was overwhelmingly positive. The average rating and standard deviation are given for each question (maximum=5).

1. How much new information did you learn on civics and American history? With 5= a lot, mean=4.63 (*sd*=0.6)
2. How interesting was the material? With 5=very interesting, mean=4.29 (*sd*=0.6)
3. How easy was the material to understand? With 5=very clear, mean=4.33 (*sd*=0.7)
4. How much new vocabulary did you learn? With 5=a lot, mean=4.46 (*sd*=0.8).

Interestingly all six texts received some votes as the favorite for a student. The most popular text was "Colonies" with a vote of 6. Three participants reported that all texts were favorites.

When asked about which activities they liked, six reported speaking with each other. Other items mentioned were working in groups, learning about the United States, tests and quizzes that assessed learning.

Except for two learners who wrote "I don't know," all participants said "do not eliminate anything" from the program, even when three learners reported that writing a summary was sometimes boring.

A learner understood what the program was trying to accomplish as s/he wrote: *"I hope we'd read more articles to learn more vocabularies…. learning the vocabularies from the short articles. And from knowing how to use the vocabularies…. Vocabularies are the base for us to communicate with others. I hope we can have the opportunities like this every term."*

Another wrote: "*This course helps me to understand different meaning of same word in different sentences.*"

Study 2

In the second implementation of CILIA, there were two major changes. First, a control group was included. Second, in addition to the vocabulary test, there was also a comprehension test given before and after the course was completed. There were also several minor changes, such as correcting misspellings in the materials and reducing redundancies across two of the readings. In addition, pre- and post-check activities now included various types of assessments (multiple choice test, fill in the blanks) rather than always writing a summary because despite providing rich data, writing summaries twice during pre and post checks was found by learners to be cumbersome.

Participants

In the second evaluation study, the experimental groups followed the CILIA curriculum described above. The control groups used the same reading materials, and took the same vocabulary and comprehension tests, but they continued with instruction as usual, instead of following the new program. Both experimental and control groups were from the same adult education center and were taught by experienced teachers.

There were 26 learners from three classes constituting the control group. (One control group was taught by one of the authors of this paper). The experimental group included 35 learners from three classes, taught by two of the authors of this paper. However, one experimental class was suddenly discontinued mid-program by management, thus reducing the experimental group's size to 23. Complete pre- and post-test data were available from 16 learners in the experimental group and 20 in the control group. Age data were available from 24 participants, with five younger than 20, eight between ages 31-40, 10 between ages 41-50, and one over 51. The education level obtained in their home countries was relatively high. In both the experimental and control groups, education data were available from 35 participants and among those participants, except for one learner, all had completed at least 9 years of schooling in their home countries.

Materials

Learners completed the same vocabulary and comprehension tests at the beginning and at the end of the course, with an interval of three months between the two tests.

1. **Vocabulary test:** This test had the same 60 multiple choice questions as in Study 1. (The error in Study 1 was corrected and there were 38 intentionally studied words)
2. **Comprehension test:** This test included 27 questions about civics and American history. Sixteen questions were in multiple choice format, for example:

   What is the Bill of Rights?

   a. Declaration of Independence
   b. The document freeing slaves

c. Stars and Stripes

d. The first 10 amendments of the Constitution.

The remaining 10 questions required a short answer [e.g., *Give one reason why the colonies wanted to be free of England*] and the maximum score possible was 40 on the comprehension test.

This cohort also had the same quizzes after every two modules as described in Study 1. Each quiz covered two modules and included both vocabulary and comprehension questions. (The control group did not take these quizzes as they did not follow the CILIA curriculum's sequence).

Results and Discussion for Study 2

The performance on the classroom quizzes is summarized in Table 3 for the experimental group. The reported data are from the 16 learners with a complete vocabulary data set and not others who may have also completed the quizzes. Quizzes assess the learning of the vocabulary and content explicitly covered in class in the previous weeks. The performance levels ranged between 75% - 91% for vocabulary and between from 74% - 89% for comprehension, indicating that the teaching was effective.

Table 3: Percent correct on the quizzes in Study 2

	n	mean	sd
Quiz 1 Vocabulary	11	75.5	32.7
Quiz 1 Comprehension	13	73.8	18.5
Quiz 2 Vocabulary	12	85.8	14.4
Quiz 2 Comprehension	12	88.7	12.7
Quiz 3 Vocabulary	14	91.4	11.0
Quiz 3 Comprehension	13	84.6	15.9

The next analysis compared the experimental and control groups on the vocabulary and comprehension tests that were given before and after the course, with a 2 (Group: experimental vs control) x 2 (Time: pre vs post) ANOVA on each measure. The pre- and post-test scores for the vocabulary and comprehension tests for the control and experimental groups are summarized in Table 4.

On intentional words, there were main effects of Group, $F(1,34) = 6.33$, $\eta^2 = .157$ and Time $F(1,34) = 20.88$ $\eta^2 = .380$. However both main effects were qualified by a significant Group x Time interaction, $F(1, 34) = 4.29$, $\eta^2 = .112$, indicating a larger growth from pre- to post-test scores for the experimental group. On incidental words, there was no such interaction, but both a Time main

Table 4: Means and standard deviations on pre- and post-tests for the two groups in Study 2

	EXPERIMENTAL n=16		CONTROL n=20		ANCOVA
	PRETEST	POSTTEST	PRETEST	POSTTEST	Group main effect on posttest (with pretest as covariate)
COMPREHENSION max=40	18.27 (9.0)	33.87 (5.0)	18.90 (7.4)	28.70 (7.5)	F(1,32) =6.30*
INTENTIONAL WORDS max=38	24.25 (5.2)	30.62 (6.6)	21.05 (7.8)	23.45 (6.8)	F(1,33) = 8.07*
INCIDENTAL WORDS max=12	8.94 (1.9)	10.00 (1.3)	5.90 (3.0)	6.55 (2.7)	F(1,33) = 6.55*
MORPHEMES max=10	5.31 (3.8)	8.37 (1.5)	2.95 (3.7)	4.75 (3.6)	F(1,33) = 9.66*

effect, F (1, 34) = 7.06, η^2= .172 and a Group main effect F (1, 34) = 19.10, η^2= .360. This indicated that both groups showed similar levels of growth although the average of pre- and post-scores were lower for the control group. On morphemes, again there were significant main effects of Group F (1.34) = 10.0, η^2= .227 and Time F (1, 34) = 18.22, η^2= .349 and no interaction. For comprehension, there was a significant main effect of Time, F(1,34) = 78.29, η^2= .703, which was qualified by a Time x Group interaction F (1, 33) = 4.08, η^2= .110.

As the initial ANOVAs show, on some measures the control group may have had lower pretest scores. However, an analysis of pretest scores indicated that only on Incidental words the pretest scores were significantly lower for the control group, t(34) = 3.51. On the remaining three measures, the pretest performances were not different between experimental and control groups, all t-tests <1.90.

However, to control for any preexisting learner differences that may exist between groups, an ANCOVA was conducted to compare the post-test scores of control and experimental groups, while using the pretest scores as a covariate. The F-test values are also presented in Table 4 (last column). This analysis compared the posttest levels of experimental and control groups while statistically controlling for pretest levels. Overall, both the control and experimental groups showed significant growth in all aspects of vocabulary and in comprehension. However, the experimental group had significantly stronger growth in all four measures. Despite the limited sample sizes, all group effects were significant, indicating that CILIA led to stronger growth in vocabulary and comprehension scores as compared to the control group, with the pretest levels taken into consideration.

Discussion

The results indicate that this program was successful in building the civics and U.S. history knowledge of the EL learners while developing their vocabulary skills. However, it must be acknowledged that the sample size was small, and the learners in the study had received a relatively high level of education in their home countries. A replication with EL learners with lower levels of education is warranted.

For adults in EL classrooms, vocabulary is a serious impediment to comprehension, especially of complex academic material. Our data indicates that CILIA, a program that integrates a systematic and comprehensive vocabulary curriculum with strong content area instruction, provides an effective approach that is also well-received by the learners. More importantly, the basic principles of CILIA can be easily applied in other contexts. Although we have implemented CILIA with EL learners using civics-U.S. history content, this basic approach can be used with other learner groups in adult education, including native speakers with low levels of language proficiency, because vocabulary and comprehension difficulties present similar challenges for native speakers as well. The program can also be implemented in other content areas such as health, finance, geography, science, and mathematics, and it can be used to improve learners' comprehension of specific materials in the workplace, thus contributing to workforce development.

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Appendix A

An example quiz (vocabulary and comprehension) in Study 1

I. Vocabulary (Fill in the blanks. The correct answers are in italics in the blanks)

We recently had a meeting with Mary Smith, who is our *representative* in Washington, DC. Mary works hard to help our neighborhood, *community* and state. *At the same time* she tries to help the whole country. She is interested in issues *such as* renewable energy, affordable housing, immigration. There is a new law that is *concerned with* children of illegal immigrants. Some people believe that these children should leave this country. *However* these children did not come here by themselves. Their parents brought them and they grew up here. I *demand* that politicians think about this issue and decide on a *permanent* solution. The president can *appoint* a committee to work on this issue. Committee can help politicians *reach* a solution.

Word bank:

concerned with	such as	appoint	representative	executive	community
at the same time	reach	demand	permanent	however	approve

II. Content

1. Name the three branches of the federal (US) government; one job of each branch and who is in that branch. The first is done for you as an example.

Its Name	One of its jobs	Who is in this branch?
1. Executive	**Run the country**	**President, vice president, cabinet**
2.		
3.		

2. Name the first two communities that Europeans formed in Northern America.

   Who helped these new settlers?

3. Why do we celebrate Thanksgiving?

   Why do we celebrate Fourth of July?