Exhibit A-5. Summary of Research Evidence for the CLC and Component Strategies

Research Evidence on Using the CLC Framework to Improve Literacy

Riverbank High School, in Riverbank, CA is located in the Central Valley of California. Targeted as a school "under improvement." adopted the CLC framework as the single focus to guide implementation of its literacy program. The district used the CLC framework as the basis for continuous improvement and used the data-driven continuous improvement cycle that leveraged the interventions developed by KUCRL researchers. Literacy improvement was adopted as part of the core mission of the high school. As a result, remarkable progress was made from year after year. No other literacy programs were used in its literacy improvement efforts.

Academic Performance Index
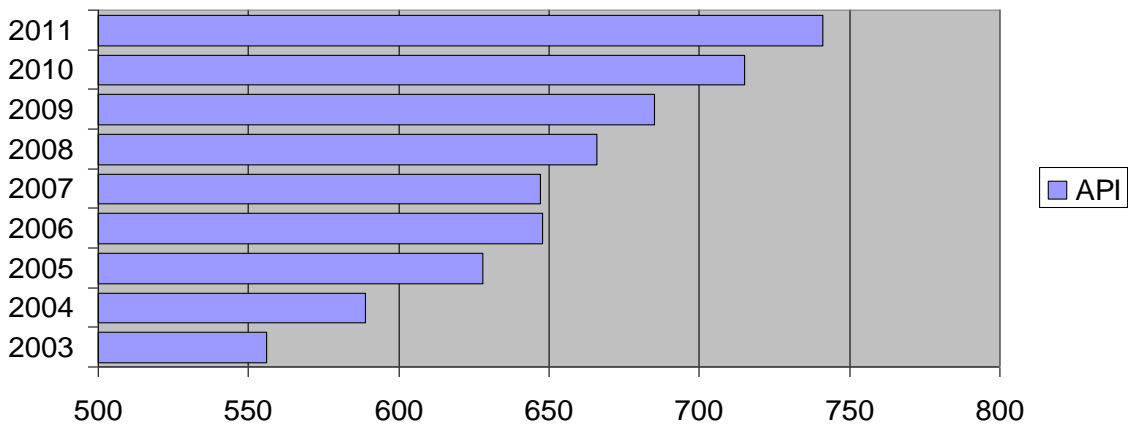
Riverbank Unified School District Academic Performance Index Growth
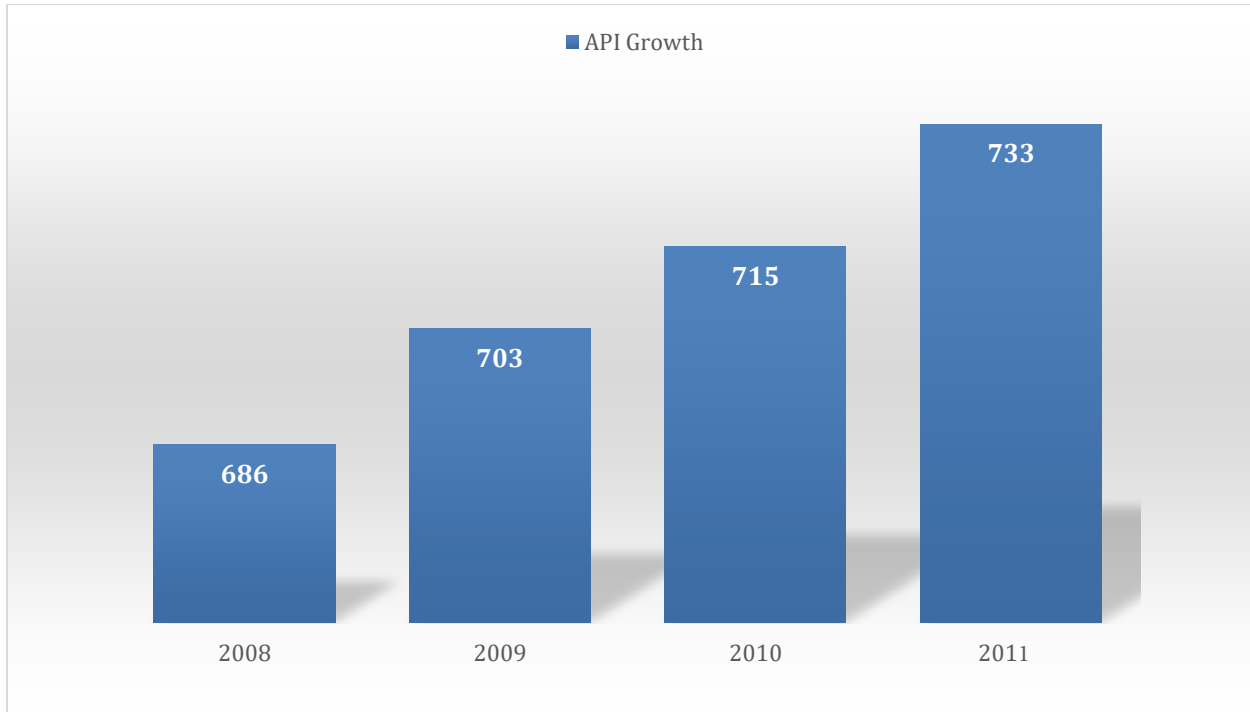
Research on Individual Interventions that Informed the CLC Framework.

The components of CLC emerged from more than more than 30 research studies completed by KUCRL researchers (e.g., see Schumaker & Deshler, 1992; Schumaker & Deshler, 2006 for reviews). Below is an annotated presentation of selected studies from the research on these interventions that support the CLC framework. *These studies support the types of instruction that support Levels 2 and 3 of the CLC framework.*

Word Identification and Fluency (Level 3 and 4 of the CLC framework)

Brasseur, I. F., & Hock, M. F. (2005). *The bridging strategy***. Lawrence: University of Kansas Center for Research on Learning.**

Deshler, D., Schumaker, J., & Woodruff, 2005. All entering 9th grade students in two high schools who were decoding two or more years below grade level. The students in the experimental school (N = 68) received instruction in the Word Identification Strategy (Lenz & Hughes, 1990; Lenz, Schumaker, Deshler, & Beals, 1984). The posttest scores for the two groups were found to be statistically different using an ANCOVA, $F(1,121) = 31.078$, $p < .001$, $\eta 2 = .692$. This is considered to be a large effect size according to Cohen's descriptions (1988).

Lenz, B. K., & Hughes, C. A. (1990). This article describes a multiple-baseline single-subject study of 12 seventh, eighth, and ninth grade students with learning disabilities testing the acquisition of the SIM word decoding strategy. Reading comprehension improved significantly for participating students.

Woodruff, S., Schumaker, J. B., & Deshler, D. D. (2003). An experimental evaluation of the SIM Word Decoding Strategy with 68 ninth grade students (including 11 with learning disabilities). Results showed significant improvement on the Slossen diagnostic Battery for Decoding for both general and special education students.

Reading Comprehension

Hock, M. F., Brasseur, I. F., & Deshler, D. D. (2005). *The summarization strategy***. Lawrence: University of Kansas Center for Research on Learning.**

Hock, M. F., Brasseur, I. F., & Deshler, D. D. (2006). After one of two years of planned instruction, students in the experimental condition (n = 37) made statistically significant gains on certain subtests of the GRADE and on a developer made reading comprehension measure (Hock & Brasseur, 2005) than did control students (n = 37). Effect sizes were calculated to be .2 for sentence completion, .9 for vocabulary and .9 for comprehension.

Clark, F. L., Deshler, D. D., Schumaker, J. B., Alley, G. R., & Warner, M. (1984). A multiple probe counterbalanced study visual imagery and comprehension after 5 to 7 hours of instruction in visual imagery and self questioning strategies among six LD students. Students improved performance considerably after strategy training.

Schumaker, J. B., & Deshler, D. D. (2006). A multiple-baseline across-students design examining the effects of Paraphrasing Strategy for 10th- and 11th-grade students with learning disabilities. The results showed that all the students mastered applying the Paraphrasing Strategy. During baseline, the students earned 0 percent of the paraphrasing points available and answered 52 percent of the questions correctly in ability-level passages and 49.5 percent of the questions in grade-level passages. After instruction, they earned 71 percent of the points available and answered of 86 percent correctly over ability-level passages and 84 percent of the questions correctly over grade-level passages.

Schumaker, J. B., Deshler, D. D., Alley, G. R., Warner, M. M., & Denton, P. H. (1982). This article describes a multiple single-subject study examining the Multipass reading comprehension strategy for 7th through 12th grade students reading at the 6th grade level. Students acquired the strategy skill and were able generalize to grade level textbook chapters.

Vocabulary (Levels 2 and 3 of the CLC Framework)

Harris, M. (2005). *The mapping vocabulary strategy* **(Research Report No. 0324).** This study employed a counter-balanced design to teach the LINCS Vocabulary Strategy to eighth-grade students enrolled in five sections of a language arts course by comparing use of mnemonic devices for the words to writing dictionary definitions. Results showed that the group of students who used the strategy earned scores statistically significantly higher than the scores of the group of students who did not use the strategy for each unit.

Wedel, M., Deshler, D. D., Schumaker, J. B., & Ellis, E. S. (1992). This study taught the LINCS Vocabulary Strategy to students in one sixth-grade social studies class. Results of the study showed that the students with LD in the experimental class earned a mean score of 53 percent on vocabulary tests in their social studies class before learning the strategy and a mean score of 77 percent after learning the strategy. Students without LD in the experimental class earned a mean score of 84 percent on vocabulary tests before learning the strategy and a mean score of 92 percent after learning the strategy. Students in the comparison class earned mean scores of 86 percent and 85 percent on tests before and after the experimental class learned the strategy.

Hock, M. F., Pulvers, K. A., Deshler, D. D., & Schumaker, J. B. (2001). The effects of an after-school strategic tutoring program on the academic performance of at-risk students and students with learning disabilities. *Remedial and Special Education, 22***(3), 16-23.**

Bulgren, J.A., Hock, M.F., Schumaker, J.B., & Deshler, D.D. (1995). This multiple baseline study examined the use the Paired Associates Strategy among high school students with learning disabilities. During baseline, the students earned an average score of 18 percent correct on the Controlled Tests and 22 percent on the Content Tests. After instruction, the students' mean score on the Controlled Tests improved to 85 percent and 76 percent on the Content Tests. Maintenance was successfully demonstrated for 83 percent of students.

Studying and Assignment Completion (Levels 2 and 3 of CLC framework).

Hughes, C. A., Ruhl, K. L., Schumaker, J. B., & Deshler, D. D. (2002). Six seventh- and eighth-grade students with LD were taught how to apply the strategy while taking tests. To measure the students' test-taking skills, a pool of 10 equivalent tests was constructed, each containing 5 sections and a total of 29 items. The results of the multiple-probe across-students design showed that the students performed an average of 30 percent of the test-taking behaviors on the checklist before instruction began. On the posttests, the students performed an average of 90 percent of the test-taking behaviors and 85 percent during maintenance probes.

Lenz, B. K., Ehren, B. J., & Smiley, L. R. (1991). A goal attainment approach to improve completion of project-type assignments by learning disabled adolescents. *Learning Disabilities Research and Practice, 6,* **166-176.**

Bulgren, J.A., Hock, M.F., Schumaker, J.B., & Deshler, D.D. (1995). This multiple baseline study examined the use the Paired Associates Strategy among high school students with

learning disabilities. During baseline, the students earned an average score of 18 percent correct on the Controlled Tests and 22 percent on the Content Tests. After instruction, the students' mean score on the Controlled Tests improved to 85 percent and 76 percent on the Content Tests. Maintenance was successfully demonstrated for 83 percent of students.

Nagel, D. (1992). Six students with LD in grades 10 and 11 participated. During baseline, they earned a mean score of 53 percent on the ability-level tests and a mean score of 51 percent on the grade-level tests. After instruction, they earned a mean score of 95 percent on the ability-level tests and a mean score of 85 percent on the grade-level tests.

Mastery of Content

These studies support how to teach content to students with limited literacy skills in core content courses. These studies support the principles of Level 1 and Level 2 of the CLC framework.

Lenz, B. K. (1984). *The effect of advance organizers on the learning and retention of learning disabled adolescents within the context of a cooperative planning model.* **Lawrence: University of Kansas Center for Research on Learning. Final research report submitted to the U.S. Department of Education, Special Education Services.**

Lenz, B. K., Alley, G. R., & Schumaker, J. B. (1987). Activating the inactive learner: Advance organizers in the secondary content classroom. *Learning Disability Quarterly, 10*(1), 53-67.

Lenz, B. K., & Adams, G. (2006). *The Unit Organizer Routine.* The researchers studied the teachers' use effects of the routine during an 8-month period in heterogeneous classes in which students with disabilities were enrolled. When the teachers used the routine, on average, understanding and retention of information by low-achieving students, students with LD, and average-achieving students improved substantially over baseline as reflected in unit test scores and in scores on unit content maps and explanations of those maps. *The Course Organizer Routine* 12 teachers who used the Routine spent more time at the beginning of the course introducing major course ideas, concepts, themes, and routines to students than did the 12 comparison teachers. Furthermore, students with LD correctly answered a greater number of course questions than peers in a comparison group.

Effect Size of CERs on Student Outcomes

SIM Content Enhancement Routines		
Principal Component	Citation	Effect Size
Concept Anchoring Routine	Bulgren, *Deshler, Schumaker, & Lenz* (2000)	0.31
Comparison Routine	Bulgren, Lenz, Schumaker, Deshler, & Marquis (2002)	0.44
Recall Enhancement Routine	Bulgren, Schumaker, & Deshler (1994)	0.52
Argumentation Routine	Bulgren, Ellis, & Marquis (2010)	0.27
Question Exploration Routine	Bulgren, Lenz, Marquis, Deshler, & Schumaker (2010)	0.34
Content Mapping (The Organizer Routines)	Lenz, Adams, Bulgren, Pouliot, & Laraux (2007)	0.67