



**Closing the Learning Divide™**

3400 Inland Empire Blvd., Suite 101  
Ontario, CA 91764  
909-476-3575

## **SUMMARY OF READING AND MATH ASSESSMENTS OF EAST LOS ANGELES COLLEGE (ELAC) STUDENTS**

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**Steve Truch, PhD**

**Executive Director, The Reading Foundation**

**Calgary, Alberta, Canada**

### **INTRODUCTION**

It is widely recognized that the majority of low income underrepresented students entering postsecondary institutions are underprepared to successfully complete college level courses. Learning process weaknesses revealed in the following assessment, conducted with students at East Los Angeles College (ELAC), appear to affect the academic performance of most underprepared low income students. Assessments using the same methodology and conducted with freshmen engineering students in March 2008 at California State University, Los Angeles demonstrated similar results. Preliminary screening of low income students for learning process weaknesses at several additional postsecondary institutions suggest an underlying pervasive national problem that has gone unrecognized. It appears that correcting learning process weaknesses is fundamental for significant progress in enabling underprepared students to succeed in college.

The purpose of the student assessments at ELAC was to determine individual learning process weaknesses in preparation for a proof of concept intervention. The intervention would demonstrate that learning process weaknesses could be corrected in a matter of weeks thus enabling students to successfully complete college level courses. Students would also achieve multiple grade levels of basic skill gains in reading, reading comprehension and understanding math concepts.

Unfortunately, due to severe budget cuts at ELAC and unsuccessful attempts to secure external funding, the recommended intervention planned for the five-week 2010 Winter Session at ELAC did not take place. However, a much larger proof of concept is planned for the summer of 2010 that will involve a partnership of East Los Angeles College, California State University at Los Angeles, the Jaime Escalante Math Program, The Reading Foundation and Learning Realization Institute.

### **BACKGROUND**

The Learning Realization Institute (LRI), a 501c3 nonprofit organization in California, has a primary goal of delivering intervention programs for underprepared matriculating college students that will enhance those basic skills and thereby provide a greater foundation for success in college programs.

LRI is working in partnership with The Reading Foundation, in Calgary, Alberta Canada. The Reading Foundation, opened in 1990 by Dr. Steve Truch, a learning psychologist, has worked successfully for many years providing one-on-one interventions to students of all ages in basic reading/spelling; comprehension; written language and math. The programs used at The Reading Foundation clinic are all proprietary and developed under the auspices of Dr. Truch ([www.readingfoundation.com](http://www.readingfoundation.com)).

At the invitation of East Los Angeles College (ELAC) Dr. Truch was invited to conduct assessments of students to establish a baseline and to help pinpoint the reading and math needs of its students. ELAC is a comprehensive urban, public community college serving 23,000 full time equivalent students. The College serves more Hispanic students than any other postsecondary institution in California and is the third largest in The United States. Serving a district with a population of 1.15 million people, ELAC enrolls 75% Hispanic students; the remaining students are Asian, African-American, or Pacific Islander (only 2.1% are Caucasian).

A total of 16 students from ELAC (enrolled in a variety of programs, ten of the students reported high school GPAs ranging from 3.0 to 3.9) were assessed using a screening battery that utilized both standardized and non-standardized instruments.

The battery is based on a reading model developed by D. Truch that assumes that good readers have highly developed decoding and comprehension abilities. In turn, these are two very complex processes. Good decoders have strong phonemic awareness, excellent knowledge of the relationship between sounds and letters, strong word identification and spelling skills and well-developed fluency when reading either orally or silently.

In terms of their comprehension, good readers have the ability to “dual-code” what they read and hear. Dual-coding involves an interaction between processing language verbally and creating mental imagery that represents the language that is being read or heard.

The test battery used to measure these various skills and components included the following:

1. Expressive Vocabulary using the Expressive Vocabulary subtest from the Comprehensive Receptive and Expressive Vocabulary Test (CREVT)
2. Phonemic Segmenting using an informal measure developed by the author
3. Code Knowledge using an informal measure developed by the author
4. Decoding using the Test of Word Reading Efficiency (TOWRE)
5. Word Recognition using the Test of Word Reading Efficiency (TOWRE)
6. Spelling using the Spelling subtest of the Wide Range Achievement Test (4<sup>th</sup> Edition) (WRAT-4)
7. Oral Reading using the Gray Oral Reading Test (GORT)
8. Listening Comprehension using the Gray Oral Reading Test (GORT)
9. Mental Imagery using a rating scale on the Gray Oral Reading Test developed by the author
10. Comprehension using the Nelson-Denny Comprehension Test
11. Math using an informal curriculum-referenced test developed by Dr. Truch.

Students were all assessed individually, except for math, which was conducted in small-group sessions. Total testing time for each student was about two hours.

## TEST RESULTS

### Expressive Vocabulary:

The Expressive subtest of the Comprehensive Receptive and Expressive Vocabulary Test (CREVT) provides standard scores that are age-adjusted.

The average standard score for the students was 80 (percentile 9). The overall vocabulary score for these students is therefore below the low end of the average range. The lowest standard score was 55 (below the 1<sup>st</sup> percentile) and the highest was 109 (percentile 73).

### Phonemic Segmenting:

The ability to identify sounds (phonemes) within a spoken word is known to be causally connected to the development of both decoding and spelling skills in students. For this informal test, students were orally presented with a word such as “blast” and asked to segment it and identify each of the phonemes in the word. The highest score on the test is 100. For strong phonemic segmenting, a score of at least 95 is considered necessary.

The average score for the 16 students was 29, which is very weak.

### Code Knowledge:

This informal test measured the student’s ability to recognize what sound is associated with a letter or combination of letters. So if the student saw the letters “igh,” the correct response would be /ie/.

A score of at least 90% is considered clinically acceptable on this test.

The average score for the 16 students was 47%.

### Word Recognition:

The ability to quickly and accurately read real words is a component of strong reading. However, students can memorize words by “sight” and read quite fluently as a consequence. The Test of Word Reading Efficiency (TOWRE) provides standardized scores for the reading of both real words and nonsense words. Students who are fluent readers should be able to read both quickly and accurately.

The TOWRE provides age-adjusted standard scores for both real and nonsense words.

The average score for real words for this group was 76.31 (percentile 6).

The average score for nonsense words was 83.3 (percentile 13).

### Spelling:

Fluent readers are also fluent spellers. The Wide Range Achievement Test (4<sup>th</sup> Edition) (WRAT 4) was used as a spelling measure in this battery.

The WRAT 4 provides age-adjusted standard scores.

The average score on the WRAT 4 for the students was 96.06 (percentile 39). This score falls in the low end of the average range. However, it was evident from the spelling errors that many of the students had memorized correct spellings despite their weak code knowledge. The ability to memorize spellings is a coping mechanism and not the mark of a good speller. Many of the students were not able to attempt a phonetic rendering of a word they had not memorized.

Reading Fluency:

The Gray Oral Reading Test (GORT) provides a measure of reading fluency expressed as a grade-equivalent score. The average fluency was grade 10.08. Thus, even though their phonemic and decoding skills were weak, most of the students were able to read quite fluently when context cues were provided. This is a compensatory mechanism, often referred to as “top-down reading,” that is not used by strong readers.

Comprehension:

Comprehension was measured in a number of ways:

- (1) Oral Reading Comprehension – Students read passages from the Gray Oral Reading Test (GORT) from different grade levels. The examiner then removed the passage and asked four questions. An acceptable recall score on each passage is 75%. The 75% criterion was used to determine the highest grade level the student could reach and still maintain the 75% recall score.

The scores were distributed as follows:

End grade 2 – 1 student  
End grade 3 – 2 students  
End grade 4 – 1 student  
End grade 5 – 4 students  
End grade 6 – 7 students  
End grade 8 – 0 students  
End grade 10 – 0 students  
End grade 12 – 0 students  
College – 1 student

Only 1 student could meet the 75% criterion beyond grade 6.

- (2) Listening Comprehension – The examiner read passages from the GORT to the student and then asked four questions, as above. The same 75% criterion score was used.

The listening comprehension scores were distributed as follows:

End grade 2 – 1 student

End grade 3 – 3 students  
End grade 4 – 4 students  
End grade 5 – 2 students  
End grade 6 – 2 students  
End grade 8 – 4 students

None of the students could meet the 75% criterion beyond grade 8.

### (3) Standardized Measure of Reading Comprehension

Since the GORT was an informal test, not a standardized one, the Nelson-Denny Comprehension Test was administered to 12 of the 16 students to provide a standardized measure of reading comprehension. The standard time version of the Nelson-Denny (20 minutes) was used. Students read as many passages as they can in the 20 minutes (silently) and then answer a series of multiple choice questions. The raw scores are converted to normal-curve equivalent scores (NCE) and grade-equivalent scores. Since the manual for this test does not describe the type of NCE scores used, the author took the liberty of converting them to traditional standard scores with a mean of 100.

The standard score for the group was 85 (percentile 16), which is just below the low end of the average range. The range of scores was from 72 (percentile 3) to 103 (percentile 55).

Eight of the 12 students scored below the 9<sup>th</sup> grade level on this test while 4 scored above the 9<sup>th</sup> grade level.

### (4) Ratings of Mental Imagery

“Dual-coding” theory is a powerful theory developed by Dr. Alan Paivio. This theory has been well-researched over many years. The gist of the theory is that strong comprehension involves an interaction between processing the language one is reading or hearing and simultaneously creating mental pictures that represent the concepts that one is reading or hearing.

There are no standardized tests to measure “dual-coding.” Therefore the author devised a Likert-type rating scale for the passages of the GORT. On this scale (from 1 to 5) a “1” represents irrelevant mental imagery while a “5” represents strong and well-connected mental pictures that capture all the major information in the passage.

Once reading or listening to a passage, the examiner would question the student as to the presence of mental pictures. If they were present, then detailed questioning was used to determine the extent of the mental imagery.

The average mental imagery score for oral reading comprehension was 0.83. The average mental imagery score for listening comprehension was 1.52. Thus, these students are not creating much in the way of mental imagery when they read or listen.

## MATH RESULTS

Math skills were assessed on an informal measure developed by the author. A total of 100 questions measuring the objectives of the California Math Curriculum from grades 3 to 7 were created for the test. Students had to answer the questions without using a calculator. The test was untimed.

The average scores for each grade level of the test were as follows:

Grade 3 – An average of 13.1 questions (of 15) were answered correctly or 88% accuracy.

Grade 4 – An average of 13.31 questions (of 17) were answered correctly or 78% accuracy.

Grade 5 – An average of 14.6 questions (of 20) were answered correctly or 73% accuracy.

Grade 6 – An average of 10.0 questions (of 22) were answered correctly or 45% accuracy.

Grade 7 – An average of 14.0 questions (of 26) were answered correctly or 64% accuracy.

The average score on the 100 questions for the entire group was 64.4% answered correctly.

#### SUMMARY AND RECOMMENDATIONS

The 16 students from ELAC who were assessed show weaknesses in basic decoding, spelling, comprehension and math skills.

The research-based intervention programs used at The Reading Foundation clinic since 1990 are designed to strengthen the weaknesses identified in the students at ELAC.

These programs can be delivered in a small-group setting by instructors trained in the procedures. The average length of time for each program is typically between 80 to 100 hours. However, program time varies from student to student.

ELAC students could certainly use significant remedial time in Discover Reading, Discover Meaning and Discover Math. The programs could be delivered intensively (6 hours per day) in small groups. Over a 5 week period, delivery of 150 hours of remedial instruction would be possible. That would allow, on average, just 50 hours of remedial time for the three programs. This is insufficient to meet their needs but still represents a good start. The actual time allocated for each program would be formalized according to student needs as best as possible prior to the program start date. In several cases, the amount of instructional time required by the students far exceeds 80 hours but again, some remedial time is better than no remedial time in these processes.

Even though the number of instructional hours does not reach the ideal, significant gains in all areas of weakness can still be expected for the students once the intervention period is completed.

Due to the current economic difficulties in our nation, the severe general budget cuts at ELAC and LRI's inability to secure external funding for the project, the critical follow up proof of concept intervention workshop has been cancelled. The Proof of Concept Workshop was planned to take place over the five-week ELAC Winter Session. It was structured to provide the learning intervention processes need to mitigate the weaknesses discovered during the individual assessments. Therefore due to the lack of funding once again LRI was not able to execute the research based interventions needed to prove that they work.

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