



Spring 2024

Soleado

Promising Practices from the Field

Transform Education New Mexico Outlines 2024 Legislative Priorities

Transform Education NM is a coalition of education, tribal, and community leaders advancing a new vision for New Mexico’s public education system. Dual Language Education of New Mexico (DLeNM) has been a member of this coalition since its inception.



The findings of fact and conclusions of law in the landmark *Yazzie/Martínez v. State of New Mexico* education lawsuit (2018) charged New Mexico with creating an equitable path for children in its public education system.

The findings include providing K-12 students with culturally and linguistically sustaining materials, support, and instruction provided by institutions and teachers with proper training, resources, and strategies to engage them in meaningful ways (<https://transformeducationnm.org/>).

The Transform Education NM coalition has identified two legislative priorities for the 2024 legislative session that invest in long-term solutions and are aligned with the *Yazzie/Martínez* ruling. House Bill 39, sponsored by Representative Yanira Gurrola (D-Albuquerque), a bilingual teacher and current program coordinator for DLeNM, seeks to allocate recurring funding to develop a plan to invest in building capacity within our

universities and colleges for training, support, and culturally and linguistically sustaining pipeline programs and research. Rep. Gurrola believes that New Mexico’s students are missing out on research-proven methods that would increase their academic success in ways that reflect and value their lived experiences because their teachers have not been trained in such approaches (Source NM, 1/16/2024).

Another targeted investment supported by the Transform Education NM coalition is the Tribal Education Trust Fund, a \$50 million appropriation in House Bill 2. This bill, sponsored by Representative Derrick Lente (D-Sandia Pueblo) would create a trust fund that would give New Mexico’s tribes more money and control to run their own education programs (KUNM, Native America Calling, 1/24/2024). The Tribal Education Trust Fund would disburse money directly to the tribes over time to help build sustainable programs that would support Native language instruction in schools, the hiring of more teachers and tutors, and provide transportation for students living in rural areas.

DLeNM is a proud partner of Transform Education NM.

For more information regarding Transform

Education NM, please visit transformeducationnm.org.



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Project GLAD® in Early Childhood: Oracy is the Key

by Christie Baird, Ed.D.—Coordinator, Orange County Department of Education Project GLAD® National Training Center

“Reading and writing float on a sea of talk.”
(Britton, 1970)

Preschool GLAD® is cognitively rich, developmentally appropriate, and focused on oral language development because oracy plays a critical role in early literacy, providing the foundations for reading and writing (Shanahan & Lonigan, 2012). Project GLAD® for Preschool/Early Childhood is founded on research about how children learn and on the impact educators can have when providing language-rich environments that support all dimensions of learning.

Research validates that young children can achieve early literacy competencies that will prepare them to be successful readers and writers (Grifenhagen, et al. 2017). Teachers’ use of sophisticated vocabulary in preschool and kindergarten is related to fourth-grade reading comprehension and decoding skills (Justice, Jiang & Strasser, 2018; Barnes, Dickinson, & Grifenhagen, 2016).

Preschool GLAD® focuses on language development with the early childhood strategies because of the research showing a significant relationship between children’s language development and their literacy development. The amount of adult-child talk has a direct impact on how children use and understand language.

Early childhood classrooms need to be places of productive noise. Jim Cummins reminds us, “When you hear the motor running, you know the brain is engaged” (Presentation, 1999). It is what we hear children saying that lets us know

what they are learning. Research tells us that 70% of the talk in the classroom should be student talk (Landry, 2004). This research is true throughout the grade levels. In Preschool GLAD®, we emphasize to teachers that their job is to “get students talking!”

The Preschool GLAD®/Early Childhood training model and strategies are explicitly designed to build oracy, which is the ability to communicate effectively using spoken language. Instruction in each strategy begins with a focus on oral language, building vocabulary, and providing multiple opportunities for children to talk together and create meaning for themselves. The oral language builds the foundation for reading and writing.

One example of how teachers can begin focusing on oral language and see that focus extended into reading and writing is the Observation Chart strategy.

Observation Charts begin as a teacher-directed oral language activity and progress through the early years to become a student-directed, peer-partner activity by first grade.

The Observation Chart strategy focuses students’ attention on the theme and provides opportunities for teachers to assess what children already know and what they are interested in learning.

The strategy begins in preschool and transitional kindergarten as a small-group strategy. Small groups of children with the teacher examine several interesting pictures related to the theme. Together, they discuss what they notice and what makes them curious. The teacher models how to think aloud, ask questions, and build on what other people say.



The Observation Chart strategy begins as a teacher-directed oral language activity and progresses to become a student-directed partner activity by 1st grade.

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With the youngest learners, the teacher makes anecdotal notes about the discussion, assessing what children know and what they are interested in learning. With four- and five-year olds, the teacher invites them to choose a picture and sketch or write on a blank sheet of paper what they notice in the picture. Students are given a pencil rather than a crayon to emphasize that they are not recreating the picture they are looking at, but rather, recording their thoughts about it. The teacher takes dictation from the students about their comments or questions, remembering to write exactly what the student says. These notes support the teacher in planning instruction focused on students' interests and needs.

In kindergarten, the teacher begins with single pictures and small groups of children, just as the strategy is used in preschool. The goal is for the teacher to model and teach how to have a discussion with others. The teacher begins the process as a guided activity in order to ensure children understand what they are being asked to do and have the knowledge of how to look at a picture and talk about it with another person. In the second or third month of school, the teacher introduces the idea of children working in pairs and sharing a pencil. The teacher is gathering information about student understanding and development in working with a partner. The partner pair chooses a picture and talks together about it and shares the pencil in recording their thoughts. The teacher is still part of the conversation, helping to develop the students' skills in making comments, asking questions, and sharing their thinking.

In the second semester of the kindergarten year, the teacher sets up picture stations around the room. The teacher ensures there are enough stations for each pair to have a station. The teacher numbers the stations and places one pair at each

one. The pair discusses the picture, records their thoughts and questions, and moves to the next station when the teacher gives the signal. The teacher intentionally chooses when to listen and when to come alongside a pair to model active listening and interpersonal skills, which are essential for collaboration and teamwork.

By the beginning of first grade, students are ready to be in AB partnerships, choosing picture clusters to observe, responding to other's statements and questions, and moving from chart to chart as they are ready.



Second-semester kindergarteners work with a partner in Observation Chart centers.

Throughout the process of using Observation Charts, children learn how to think and talk about something they observe. They learn how to listen to other people and respond to the ideas of others. They develop the understanding that what they say can be written down and responded to. Observation Charts begins as an oral

activity and ends as an activity that combines oral and written language (sketches and words). Building oracy in the early years enables students to participate in the strategy purposefully and successfully in elementary school.

The continuum of using the Observation Chart strategy is just one example from *Preschool GLAD*®.

Another strategy that begins as an oral language strategy and builds to a reading and writing strategy is the Narrative Input Chart.

In Preschool/TK/beginning of K, the Narrative Input Chart is based on the oral tradition of storytelling and is used to support students in learning the elements of a story (characters, setting, plot, problem, solution). The teacher chooses or writes a story related to the theme and that has a repetitive phrase and a strong beginning, middle, and end. Because the story

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Summary Report from the National Science Foundation (NSF) (2017-2022): Mathematical Growth Among English Learners at Risk and Not at Risk for Math Difficulties

by Dr. Stefania Petcu—Project Director, University of New Mexico and University of Kansas, and Dr. H. Lee Swanson—Principal Investigator, University of New Mexico and University of California Riverside

Importance of the Study

Although math instruction for native English-speaking children has a strong research base, much less is known about effective teaching for English Learners (EL). The sparse research is troubling because this group continues to have a high dropout rate, low achievement scores, high mobility, and high poverty (National Center for Education Statistics, 2022). Further, mathematic skills are necessary for future academic success, career aspirations of higher prestige, and overall higher earning potential. According to the National Assessment of Educational Progress, 70% of ELs in the United States scored below basic and 7% were at or above proficient in 4th-grade math. By 8th grade, 71% percent of ELs were below basic and just 3% scored at or above proficient in math. A major challenge for ELs is not only overcoming a language barrier but also overcoming low academic achievement. English learners continue to be at a disadvantage because they often have not yet developed age- or grade-appropriate proficiency in speaking, reading, or writing in English. The reason behind the prevalence of low achievement in ELs with Spanish as a first language in the U.S. public school system is unclear, because neither a method for accurate identification nor a consistent definition exists across states. Although low achievement is traditionally defined as not meeting a certain cut-off point across grades on normed-referenced tests, these cut-off points vary across school districts and states. For example, some states/districts define low mathematical achievers as the students who score consistently below

the 25th percentile on standardized tests. These challenges underscore the need for a better method for accurately identifying EL children at risk for academic difficulties so targeted intervention can be provided.

Thus, this NSF study had two major objectives:

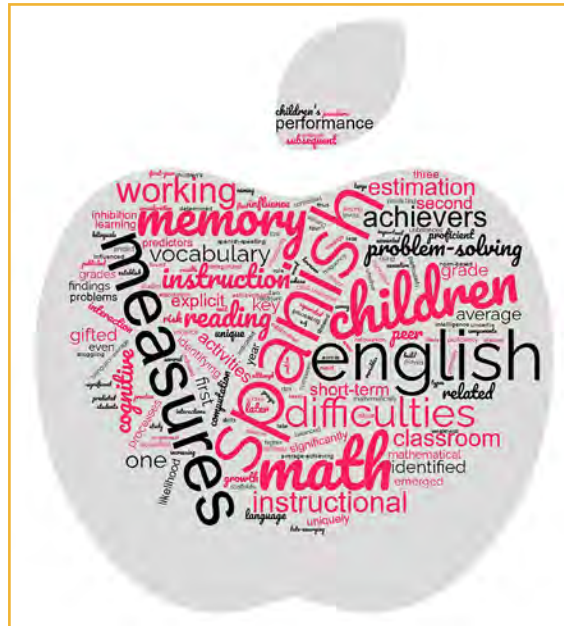
- (1) Identify the cognitive processes of children who excel and those who consistently fail in math performance among Spanish-speaking children who are learning English as a second language.
- (2) Determine those cognitive and instructional variables that mediate (i.e., positively influence) this relationship so effective instruction can be developed.

Overview of Procedures

This was a five-year longitudinal project (2017 - 2022). The research sites were in New Mexico and California and included over 400 elementary-age students who spoke Spanish as their first language. All children were enrolled in two-way dual language immersion programs, in which the instruction was delivered in Spanish and English. Ninety-five percent of the children participated in a federally funded lunch program. At each of the research sites, students began Grade 1 with 80% Spanish language instruction and 20% English instruction. Each year, English language instruction increased, with 70% Spanish and 30% English in second grade. By third grade, students received 50/50 English-Spanish language instruction.

To this end, EL children in Grades 1, 2, and 3, at the first round of testing, were administered a

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dual language immersion programs, in which the instruction was delivered in Spanish and English. Ninety-five percent of the children participated in a federally funded lunch program. At each of the research sites, students began Grade 1 with 80% Spanish language instruction and 20% English instruction. Each year, English language instruction increased, with 70% Spanish and 30% English in second grade. By third grade, students received 50/50 English-Spanish language instruction.



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battery of math, reading, vocabulary, and cognitive (short-term memory [STM], working memory [WM], rapid naming (timed naming of letters and numbers in order), and inhibition (timed naming of numbers and letters out of sequence) measures in both English and Spanish. The battery of tests was administered again one year and two years later to the same participants. In addition, classroom math instruction was observed throughout the project, teachers completed behavior ratings on children, and provided information on instructional practices. In terms of comprehensiveness, this study had the largest array of Spanish and English measures that cover areas of math, reading, language, and cognitive processing when compared to other nationally recognized longitudinal studies on EL children to date. Other studies have primarily focused on English proficiency measures and/or are limited to one academic domain such as reading.

Some Conclusions from the Study?

Although the study results are still being analyzed, we can provide five general findings. The results are organized in terms of the topic, why the finding was important, how the information was gathered, and the finding(s) that emerged.

Finding 1:

Key instructional activities that increase EL children's later math performance on normative math measures were identified.

Why important? Although several classroom instructional activities (e.g., explicit instruction, peer interaction, instructional scaffolds) are expected to enhance EL children's classroom performance, the significant association between these classroom activities and Spanish-speaking EL

children's achievement on normative measures in subsequent grades has not been established. More importantly, no published studies have determined those instructional components that influence EL children's later math (subsequent grades) performance. This is important for establishing instructional practices across grade levels and to build on skills from one grade to the next.

Our Approach. We developed an observation form that determined the frequency of instructional activities (e.g., instructional scaffolds, teaching algorithms, explicit instruction, peer interaction) that were significantly related to later normative

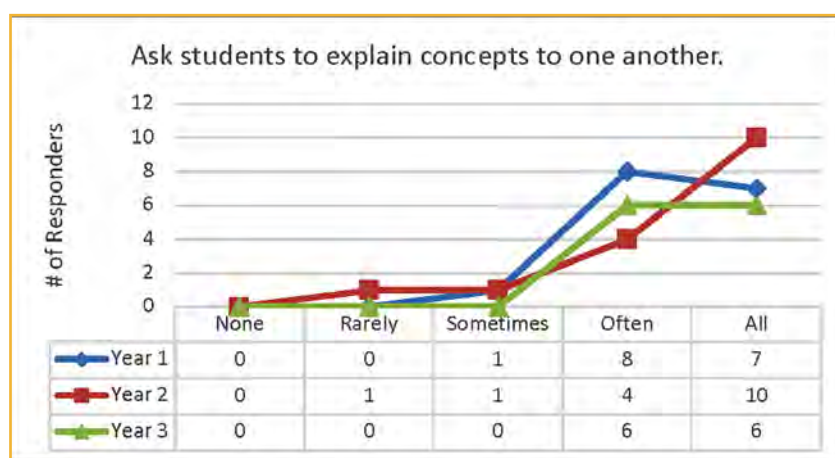
achievement measures and cognitive scores. Multiple classroom observations were conducted in the first-year testing period across three time points (fall, winter, and spring).

Finding. Two major findings emerged.

First, strategy

instruction, peer interaction, and explicit instruction in the first year uniquely predicted norm-based English mathematical problem-solving scores in second year. These findings emerged even when grade level, vocabulary, reading, and calculation were accounted for. Second, children with math difficulties were less likely to be in classrooms in which the teacher used frequent instructional activities related to strategies, explicit instruction, and peer interactions than average-achieving children.

Li, J., Arizmendi, G. D., & Swanson, H. L. (2022). The influence of teachers' math instructional practices on English learners' reading comprehension and math problem-solving performance in Spanish and English. *International Journal of Bilingual Education and Bilingualism*, 25(10), 3614-3630. doi:https://doi.org/10.1080/013670050.2022.2068346



The study looked at key instructional activities that increased students' later math performance.

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OCDE Project GLAD®—The “How” of Dual Language Bilingual Education

by Natalie Olague—Project Coordinator, DLeNM, Ana Lobato—Kindergarten Teacher, and Araceli Reyes—2nd Grade Teacher, East Elementary School, Zion, IL

Introduction

In the fall of the 2021-2022 school year, the American Councils Research Centers did a canvass of Dual Language Bilingual Education (DLBE) programs in the United States and found that more than 3,600 such programs existed across the country (americancouncils.org). Each one of these programs is built upon the three foundational goals or pillars of dual language education, (1) High academic achievement, (2) High levels of bilingualism and biliteracy in English and the partner language, and (3) Sociocultural competence. Despite their prevalence in communities around the country, how these DLBE programs address issues of curriculum and instruction varies significantly. This article seeks to show that within DLBE programs, OCDE Project GLAD® stands out as the most effective instructional framework.

Even though OCDE Project GLAD® was not originally developed for DLBE programs, we have found that there is considerable alignment between the big ideas of GLAD® and the principles that guide dual language programming. To that end, we have developed the following table in an effort to illustrate how best practices for DLBE instruction from the Guiding Principles for Dual Language Education (2018) correlate with the big ideas of OCDE Project GLAD®.

Best Practice for DLBE Instruction from <i>Guiding Principles for Dual Language Education</i> (2018)	The OCDE Project GLAD® instructional framework is based on research-based instructional strategies ...
Teachers integrate language and content instruction.	... that intentionally integrate language and content standards.
Students are routinely engaged in meaningful activities that require sustained language use in each program language.	... that intentionally provide opportunities for students to use language in context. Project GLAD® strategies can be implemented in either DLBE program language, which provides a foundation of instructional equity.
Standards-based academic content instruction is provided in both program languages in a coordinated way.	... that intentionally provide comprehensible input via brain-based teaching and learning. These strategies can be implemented in either program language and intentionally coordinated for deep content cognition.
Explicit language arts instruction is provided in both program languages, is based on language-specific standards, and is coordinated across languages to ensure biliteracy development.	... that intentionally focus on language comprehension (e.g., background knowledge, vocabulary, language structures, verbal reasoning, and literacy knowledge). These strategies can be implemented in either program language and intentionally coordinated for biliteracy development.
Instruction in one language builds on concepts learned in the other language.	... that can be used to bring the two program languages in a DLBE program together. There are many authentic opportunities for promoting metalinguistic awareness, leveraging students’ bilingualism and bridging content learning across languages because of how these strategies are integrated into the framework. These opportunities are consistent with other metalinguistic strategies such as “The Bridge”, developed by Beeman and Urow (2013) and Así se dice, developed by Escamilla et al. (2014).
Instruction promotes metalinguistic awareness and metacognitive skills.	
Instruction leverages students’ bilingualism by strategically incorporating cross-linguistic strategies.	
Instruction incorporates appropriate separation of languages to promote high levels of language acquisition.	

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Case Study: Zion Elementary School District 6

Dual Language Education of New Mexico (DLeNM) began partnering with Zion Elementary School District 6 in Zion, Illinois in the spring of 2019, before the school began its 80/20 Spanish-English DLBE program and continues today. East Elementary School is a K-2 school with approximately 250 students (221 are classified as multilingual learners), 18 teaching staff, and 3 classrooms per grade level. The students from East Elementary School entering 3rd grade go to West Elementary School to continue in the dual language program in Grades 3-5.

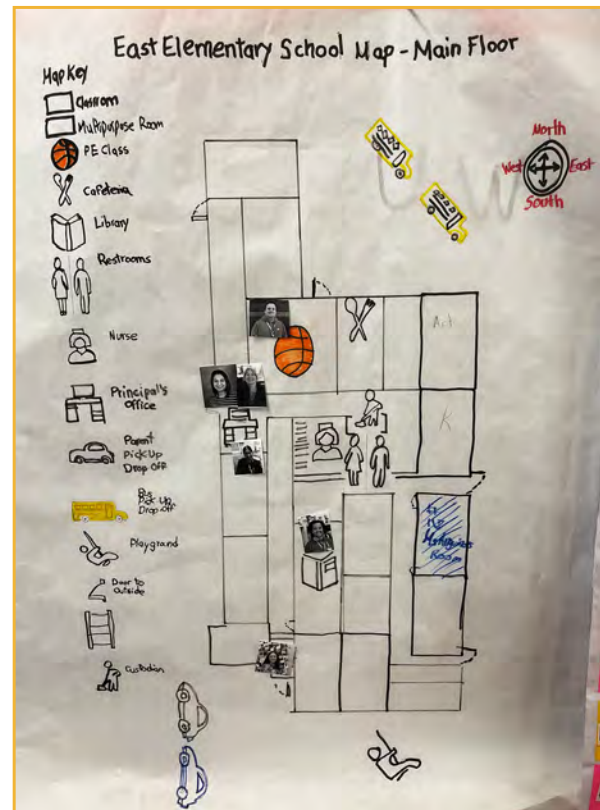
In the spring of 2022, the educators at East Elementary School made a significant decision—they opted to transition from the district’s established language arts published curriculum to embrace teacher-developed Project GLAD® units. Since then, the partnership work between DLeNM and the school’s staff has focused on fine-tuning teachers’ use of GLAD® strategies and developing units to be implemented in the language arts block of time as determined by their language allocation plan, detailed in Table 1.

Table 1. East Elementary School DLBE Language Allocation Plan

Grade	SLA/SLD Science & Social Studies	ELA/ELD Science & Social Studies
K	60 min	30 min
1st	40 min	50 min
2nd	30 min	60 min

First Grade School Community Unit - English Instruction

An example of a 1st grade Project GLAD® unit developed for East Elementary is the School Community Unit. In the English language space, geography standards were addressed using a School Map Input Chart (listening and reading domain), along with corresponding “turn and talk” prompts (speaking domain) and learning logs (writing domain). Then a First Graders Here There Chant was introduced, highlighting students’ identities (3rd goal of DLBE). Frequent practice of the chant led to a Sentence Patterning Chart (SPC) developed by the students—a rich source of guided oral practice and vocabulary development. The SPC then became a scaffold for student sentence writing, addressing English Language Arts standards. These images show artifacts of the strategies implemented in English.



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is not used for direct input, it does not have to be factually correct. For example, if the theme is Construction, the story could be “The Three Little Pigs”. This story would never actually happen, but it meets the element requirements for using this strategy to build a language foundation. The teacher tells the story, inviting the children to join in with the repetitive phrase. After telling the story two or three times, the teacher invites the children to join in the telling by distributing the pictures and having the children come up and put the picture on the background when they hear the words that describe the picture they are holding. When distributing the pictures, the teacher encourages the children to turn to their neighbor and talk about the picture they received. This involves all the children in the process, even though not every child is holding a picture. After a few days of whole-group storytelling, the teacher moves the story into a center and children can retell the story with each other during center time.

In Kindergarten, children are beginning to read print. The Narrative is still used for the oral storytelling tradition, but the teacher creates word cards or speech bubbles with words and “talk” from the story. After telling the story two or three times for oral language development, the teacher distributes the word cards or speech bubbles to the students. The teacher is intentional when distributing the cards, saying the word if needed or just handing the card to the student. Students turn to each other and read the words. This gives everyone practice and involves all students. The teacher retells the story and students come up and put their word or speech bubble on the appropriate picture when they hear the word they are holding.



After a few days of group story telling, the teacher moves the Narrative Input Chart into a center where children can retell the story to each other.

As children grow as readers, teachers can write phrases rather than words.

At the end of Kindergarten or at the beginning of first Grade, teachers can begin to use the Narrative Input Chart as input for new information. The basis is still a story, but the

focus has expanded beyond the oral tradition of storytelling and has the added dimension of providing factual information that continues student understanding of the material.

Every strategy in Preschool GLAD® is based on these two questions: “How does this strategy support building needed skills?” and “What does this strategy look like at each stage of development?” Key to every consideration is how oracy influences literacy development in any language.

Reading and writing float on a sea of talk (Britton, 1970). Play, talk, sing, read, and write every day in your classroom. Make your classroom come alive with student talk!

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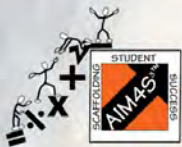
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Swanson, H. L., Kong, J., Li, J., & Petcu, S. D. (2022). The relationship between early classroom activities and English language learners' later math problem-solving performance: An exploratory study. *Learning Disabilities Research & Practice, 37*(4), 242-261. doi:<https://doi.org/10.1111/ldrp.12280>

Finding 2:

Key cognitive measures that underlie math difficulties were identified so that instructional intervention could be developed.

Why important? One of the key areas in math found particularly difficult for EL students whose first language is Spanish is solving mathematical word problems. For example, consider solving a word problem such as, “15 dolls are for sale. 7 dolls have hats”. The dolls are large. How many dolls do not have hats?” Children must access pre-stored information (e.g., 15 dolls), access the appropriate algorithm (15 minus 7), and apply problem-solving processes to control its execution (e.g., ignore the irrelevant information). Given the multi-step nature of math word problems, the cognitive mechanisms in solving these problems need to be identified so effective instruction can be developed.

Our Approach. A large battery of measures to pinpoint strength and difficulties in children at risk and not at risk across three years was administered. As expected, EL children not at risk for math difficulties outperformed children with math difficulties on a host of measures. Significant difficulties were found on both English and Spanish measures of reading, numeracy (judging which numbers are smaller or larger (146 vs. 164), math estimation (e.g., judging on a linear line that varies from 0 to 100 where a number (e.g., 25) resides, vocabulary, naming speed (quickly naming letters and numbers), short-term memory, and working memory (WM) across all grades and the three testing waves. These findings were not helpful because they do not identify those measures that uniquely underlie such children's processing difficulties. Thus, further analysis was necessary that took into consideration context (classroom), age, the cohort they were in, school, etc.

Finding. We identified those cognitive processes

that uniquely underlie math difficulties in EL children. From a large array of English and Spanish measures, one of the key cognitive processes that predict math difficulties was growth on measures of executive processing (working memory). These measures were robust in predicting math difficulties even when the influence of English and Spanish measures of vocabulary, reading, and/or computation proficiency was controlled for. Working memory is defined simply as the general ability to monitor the recall of relevant information and inhibit (or suppress) irrelevant information.

Does WM have relevance to everyday learning? It does. For example, holding a person's address in mind while listening to instructions about how to get there, listening to a sequence of events in a story while trying to understand what the story means, locating a sequence of landmarks on a map while determining the correct route, listening to specific word features in the context of multiple words, and so on. All these tasks have some aspects of interference (a competing memory trace that draws away from the targeted memory trace) and monitoring (decisions related to the allocation of attention to the stimulus that is under consideration together with the active consideration of several other stimuli).

Swanson, H. L., Arizmendi, G. D., & Li, J. (2022). What mediates the relationship between growth in math problem solving and working memory in English language learners? *Journal of Educational Psychology, 114*(7), 1608-1632. doi:<https://doi.org/10.1037/edu0000718>

Swanson, H. L., Arizmendi, G. D., & Li, J. (2021). Working memory growth predicts mathematical problem-solving growth among emergent bilingual children. *Journal of Experimental Child Psychology, 201*, 33. doi:<https://doi.org/10.1016/j.jecp.2020.104988>

Finding 3:

Key cognitive processes that predict late-emerging math difficulties were identified.

Why important? Some EL children are relatively proficient in the early stages of learning to solve mathematical word problems, but experience math difficulties in subsequent years. This study determined those measures that significantly increased the odds of correctly identifying children

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with late-emerging math difficulties.

Our Approach. The study sought to identify the significant growth parameters that increased the odds of identifying late-emerging math difficulties in children relative to children with stable math deficits (low performance across all three years of testing in both English and Spanish). Children defined as late-emerging at risk are those with average math scores (> 25th percentile on normative measures) in the first year of our study, but fall below the 25th percentile in testing waves 2 and 3. Thus, we compared average EL achievers (scores in English and Spanish math above the 25th percentile for all three testing waves), children with persistent math difficulties (< 25% all three years), to late-emerging children with math difficulties.

Finding. When compared to average EL achievers, late-emerging math difficulties children showed weakness on measures of English reading, Spanish estimation, Spanish STM, and Spanish WM. Thus, predictors of later problems in math problem-solving are significantly related to performance in three Spanish measures (estimation, short-term memory, and working memory) and one English measure (reading).

Swanson, H. L., Arizmendi, G. D., & Li, J. (2023). Emergent math difficulties among English learners: Can the odds be reduced? *Child Neuropsychology*, 29(1), 136-164. doi:<https://doi.org/10.1080/09297049.2022.2073987>

Swanson, H. L., Kong, J., & Petcu, S. D. (2023). Stability of learning disabilities, cognitive growth, and L1 in English learners: A latent class and transition analysis. *Journal of Educational Psychology*, 115(3), 379-404. doi:<https://doi.org/10.1037/edu0000771>

Finding 4:

The key processes that separate language acquisition difficulties from math difficulties were identified.

Why important? Controversy exists as to whether EL children are under or overrepresented in special education. Can children at risk for serious learning difficulties

in math be separated among a heterogeneous sample of children who are English learners?

Our Approach. Using procedures that take growth into consideration, we identified four distinct types of achievers: (a) balanced (proficient in both English and Spanish) bilinguals-average achievers, (b) unbalanced bilinguals (more proficient in Spanish than English) average achievers, (c) children at risk for learning difficulties, and (d) children with low Spanish and English vocabulary. The study estimated that 20% of our total sample was at risk for learning difficulties in the first testing wave, with late-emerging academic difficulties increasing to 5% at the later testing waves.

Finding. This study identified children at risk for learning difficulties who are struggling with second language acquisition. Classroom math instruction was primarily in Spanish. The key measures that separated the groups were three Spanish measures (short-term memory, inhibition, and working memory). Children with learning difficulties were weaker in performance compared to children who varied in English language acquisition on these measures.

Swanson, H.L., Kong, J., Petcu, S., & Pimentel, M. (2020). Can language acquisition be separated from learning disabilities? *Exceptional Children*, 86, 293-309

Swanson, H. L., Arizmendi, G. D., & Li, J. (2021). The stability of learning disabilities among emergent bilingual children: A latent transition analysis. *Journal of Educational Psychology*, 113(6), 1244-1268. doi:<https://doi.org/10.1037/edu0000645>

Finding 5:

The profile of EL children who are precocious (gifted) in math was identified.

Why important? Few studies have focused on EL children who excel in math computation. That is, although several studies have examined individual differences in EL children's mathematical performance in the elementary grades, few studies have focused on math-advanced elementary school-age children, especially among those children who are emergent bilinguals (EB). To our knowledge,



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no published studies have investigated the cognitive characteristics of mathematically gifted EL children across a broad array of measures in the child's first (Spanish) and second (English) language. Previous studies' inability to identify a cognitive profile of young EB children who are gifted in math processing has likely been due to issues in assessment. Factors related to language proficiency, cultural and linguistic background, acculturation, and socioeconomic status (SES) of EL students, test administration methodology (e.g., translations, availability of bilingual examiners), and the assessment instruments used with EL students (e.g., not included in the norm sampling group, differentiating low language proficiency from low achievement or ability) have all played a role in determining the scope of early investigations.

Our Approach. Although our research focus was on mathematical problem-solving, some children yielded high (> 98th percentile) scores on norm-based computation measures. Our first testing wave compared mathematically gifted children in computation to children who were average math achievers or low math achievers in computation.

Finding. The comparison of the groups (gifted, average, low computation) yielded several significant differences on a multitude of measures. However, only a few variables played a unique role towards increasing the likelihood of identifying mathematically gifted EL children. The first-year results indicated that the likelihood of identifying gifted children among EL children in math computation was related to measures of fluid intelligence, English estimation, Spanish problem-solving, and English working memory. Thus, in contrast to our hypothesis that mathematical giftedness in EL children would be tied primarily to the first language (Spanish), our results also suggested the cognitive measures for predicting gifted achievers also emerged on measures administered in English. In sum, cognitive measures that included estimation (e.g., judging on a linear line that varies from 0 to 100 where a number (e.g., 25, resides) and working memory in English, and problem-solving in Spanish were unique predictors that significantly influenced whether a child was categorized as gifted relative to average achievers.

Swanson, H. L. Kong, J. & Lussier, C. (2023-in press). Cognitive processes that underlie mathematically gifted emergent bilinguals. *Journal of Experimental Child Psychology*.

Our analysis of the data is continuing. We hope to share our analyses in a later Soleado article. Additionally, we are currently focused on developing and testing a cognitive strategy math problem-solving intervention for use in elementary classrooms. A list of published work for each finding and work in progress can be obtained from Dr. Petcu at spetcu@unm.edu or spetcu@ku.edu and Dr. Swanson at hlsSwanson@unm.edu or Lee.Swanson@ucr.edu.

References

U. S. Department of Education. Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP). 2022 Mathematics Assessment. <https://lccn.loc.gov/2003557390U>



I want to thank the custodian for _____.

School Map Learning Log #1

Name: _____ Date: _____

Text	You
<p>When you see a blue rectangle on our school map, what does it symbolize?</p>	<p>What direction is your house from our school?</p>
<p>A blue rectangle on our school map is the symbol for a _____</p>	<p>My house is _____ from our school.</p>
<p>Draw our classroom from a "bird's eye view".</p>	<p>Draw your house from a "bird's eye view."</p>



Adjective	Noun	Verb	Prepositional Phrase
<p>Happy ☺ ☹</p>	<p>First graders</p>	<p>playing</p>	<p>Where? in the playground</p>
<p>Kind ☺☺</p>	<p>☺☺☺☺☺☺☺☺☺☺</p>	<p>helping</p>	<p>in the classroom</p>
<p>Smart ☺☺</p>	<p>☺☺☺☺☺☺☺☺☺☺</p>	<p>reading</p>	<p>at the library</p>
<p>Hungry ☹</p>	<p>☹☹☹☹☹☹☹☹☹☹</p>	<p>eating</p>	<p>on the bus</p>

First Graders Here There Chant
By Natalie Olague

First graders here, first graders there,
First graders, first graders everywhere.

☺☺ Bilingual first graders playing.

☺☺ Kind first graders helping.

☺☺ Smart first graders reading.

☹☹ And, hungry first graders eating.

First graders throughout the playground

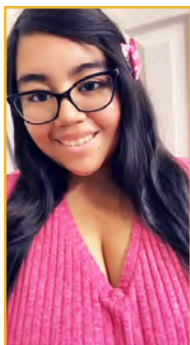
First graders in the classroom

First graders at the library.

And, first graders on the bus

First graders here, first graders there,
First graders, first graders everywhere.

First graders! First graders! First graders!



Araceli Reyes, 2nd grade teacher, East Elementary School, Zion, IL

I learned so much implementing GLAD® strategies in my classroom this school year! I learned that students are much more excited to learn when they are actively participating in the learning process and the GLAD® strategies are all about active student participation. I learned that it is more important to take things slow and support students' deep content understanding than to get through all the strategies. Less is more! All of my students showed gains in Fountas and Pinnell reading levels in both languages from fall to spring and I truly believe it was because they were so engaged in the GLAD® strategies I was using.



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1st Grade School Community Unit - Spanish Instruction

Continuing with the theme of school community, Spanish Language Arts standards were addressed using a Narrative Input Chart of the book *Lola en la biblioteca* (2008). Similar to the instruction in the English space, intentional “turn and talk” prompts and learning logs were used with the Narrative Input Chart. Then, a Lola aquí Lola allá chant was introduced and processed with Picture File Cards, sketching, gestures, and frequent recitation. The chant led to a Lola Sentence Patterning Chart (SPC) developed by the students, which provided a rich source of Spanish-language guided oral practice and vocabulary development. The SPC then became a scaffold for student sentence writing, addressing Spanish Language Arts standards. These images show artifacts of the strategies implemented in Spanish.



Mi predicción es _____.

Sustantivo	Adjetivo	Verbo	frase Preposicional
 Lola	 feliz cansada sedienta tranquila	 leyendo caminando bebiendo durmiendo	¿Donde? en la biblioteca junto a su madre al lado de la bebe frente a la estanteria

Lola aquí Lola allá
por Natalie Olague

Lola aquí, Lola allá,
¡Lola, Lola, ra, ra, ra!

Lola leyendo

Lola cansada caminando.

Lola sedienta bebiendo.

y Lola tranquila durmiendo.

Lola en la biblioteca.

Lola junto a su madre.

Lola al lado de la bebe.

y Lola frente a la estanteria.

Lola aquí, Lola allá,
¡Lola, Lola, ra, ra, ra!

¡Lola! ¡Lola! ¡Lola!



Ana Lobato,
Maestra de
Kinder, East
Elementary
School, Zion, IL

Mi objetivo es que los estudiantes entren y salgan de mi salón de clases sintiéndose entusiasmados con lo que estamos aprendiendo ese día. Usar estrategias GLAD® en mi salón de clases me permitió lograr este objetivo. GLAD® proporciona a los maestros habilidades y estrategias para garantizar que nuestros estudiantes de idiomas puedan acceder y comprender el contenido, independientemente de su nivel de idioma. Todos mis estudiantes mostraron un gran progreso en los niveles de lectura de Fountas y Pinnell desde el otoño hasta la primavera y creo que la razón fue porque estaban muy emocionados de aprender con las estrategias GLAD.®

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The next step in our unit development will be to add intentional metalinguistic strategies to bring the two partner languages together. In keeping with Beeman and Urow's *The Bridge* (2013), the teacher could add a strip of paper next to any of the columns of the SPC (adjectives, noun, verbs, and prepositional phrases) in English focused on first-grader identities to encourage students to bridge key vocabulary to Spanish. Likewise, the Spanish teacher could use the SPC on Lola, the character in the shared reading, add a strip next to any of the columns (sustantivo con artículo, adjetivos, verbos, frases preposicionales) and interactively bridge that vocabulary to English. The next step will be to add other formal metalinguistic charts in both languages, per Teaching for Biliteracy (2013) process.

Grade Level Yearlong Project GLAD Unit Plans

Following the structure described above, units were developed for grades K-2 and are summarized in the following tables.

Table 2. East Elementary Kindergarten Project GLAD Units

Unit 1		Unit 2		Unit 3		Unit 4	
Spanish	English	Spanish	English	Spanish	English	Spanish	English
Back to School		Community Helpers		Animal Habitats		Seasons	
Input Charts: el salón el salón de música, el salón de arte, el gimnasio, el patio de recreo, el baño, la biblioteca, la enfermería	<i>Pete the Cat Rocking My School Shoes</i> Narrative Input	Input Charts: el bombero, el dentista, el doctor, el policía, la maestra	<i>Tito the Firefighter</i> Narrative Input (3rd Goal) Tito Here There Chant and SPC	Input Charts: el oso, el pulpo, la hormiga, el perrito de la pradera, el zorro ártico	<i>Inky the Octopus</i> Narrative Input Inky Here There Chant SPC	Input Charts: la primavera, el verano, el otoño, el invierno Meteorólogos aquí, meteorólogos allá Chant & SPC	<i>The Snowy Day</i> Narrative Input (3rd Goal) Peter Here There Chant & SPC
Estudiantes aquí, estudiantes allá Chant and SPC (3rd Goal)	Pete Here There Chant & SPC						

Table 3. East Elementary 1st Grade Project GLAD Units

Unit 1		Unit 2		Unit 3		Unit 4	
Spanish	English	Spanish	English	Spanish	English	Spanish	English
School Community		The Farm		Sound & Light		Objects in the Sky	
<i>Lola en la biblioteca</i> Narrative Input Lola aquí Lola allá chant & SPC	East Elementary School Map w/Learning Logs First Graders Here There Chant & SPC (3rd Goal)	<i>La Gallinita Roja</i> Narrative Input Gallinita aquí, Gallinita allá Chant & SPC	Farm Map Cow Pictorial Animals Here There SPC	<i>¡Toca, Chavi, Toca!</i> Narrative Input (3rd goal) Chavi aquí, Chavi allá Chant & SPC <i>La Luz de Lucía</i> Narrative Input Chart Lucía aquí, Lucía allá Chant & SPC	Talking Drums Input Chart (3rd Goal) Sound Here There Chant & SPC Lighthouse Input Chart Light Here There Chant & SPC	<i>El Sol, la Luna y el agua</i> Narrative Input Chart (3rd Goal) Sol aquí, Sol allá Chant & SPC Luna aquí, Luna allá Chant & SPC	Sun Input Chart Sun Here There Chant & SPC Moon Input Chart Moon Here There Chant & SPC

Conclusion

In conclusion, the Project GLAD® instructional framework clearly resonates with and fortifies effective DLBE curriculum and instruction as reflected in the unit development work undertaken at Zion Elementary School District 6. Looking ahead, the district's next steps include integrating the metalinguistic focus charts into the K-2 unit plans, thereby bolstering optimal practices for bilingual and biliteracy development. Furthermore, the expansion of Project GLAD® unit development for Grades 3-5 and the ongoing refinement of existing units remain pivotal for continued progress.

Resources

- 2021 Canvass of Dual Language and Immersion (DLI) Programs in US Public Schools. americancouncils.org/research-assessment/studies-and-reports
- Beeman, K. & Urow, C. (2013). *Teaching for Biliteracy*. Philadelphia, PA: Caslon.
- Escamilla, K., Hopewell, S., Butvilovsky, S., Sparrow, W., Soltero-González, L, Figueroa, O., & Escamilla, M. (2014). *Biliteracy from the start*. Philadelphia, PA: Caslon.
- Howard, E. R., Lindholm-Leary, K. J., Rogers, D., Olague, N., Medina, J., Kennedy, D., Sugarman, J., & Christian, D. (2018). *Guiding Principles for Dual Language Education* (3rd ed.). Washington, DC: Center for Applied Linguistics.
- McQuinn, A. (2008). *Lola en la biblioteca (Lola Reads) (Spanish Edition)*. Watertown, MA: Charlesbridge Publishing.

Table 4. East Elementary 2nd Grade Project GLAD Units

Unit 1		Unit 2		Unit 3		Unit 4	
Spanish	English	Spanish	English	Spanish	English	Spanish	English
Community Helpers		Forces that Change the Earth		Let's Make a Change		Seed Dispersal	
<i>Querido Primo</i> Narrative Input (3rd Goal) Carlitos aquí Carlitos allá chant & SPC Charlie aquí Charlie allá chant & SPC	Zion Map Input Chart Firefighter, Custodian /Sanitation Worker Input Charts Citizens Here There Chant & SPC	<i>La montaña de fuego</i> Narrative Input Chart (3rd Goal) Dionisio aquí Dionisio allá Chant & SPC	<i>Volcano</i> Input Chart Geologists Here There Chant & SPC	<i>Lado a lado</i> Narrative Input Chart (3rd Goal) César Chavez aquí, César Chavez allá Dolores Huerta aquí, Dolores Huerta allá Chant and SPC	Timeline Input Chart Popay Input Chart (3rd Goal) Leaders Here There & SPC (3rd Goal)	La semilla que no quería crecer Narrative Input (3rd Goal) Semilla aquí, semilla allá	Seed Dispersal Input Chart Wind Dispersal Input Chart Seeds Here There & SPC





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