

School-Family-Community: Contextual Influences on Early Math Learning for English Learners

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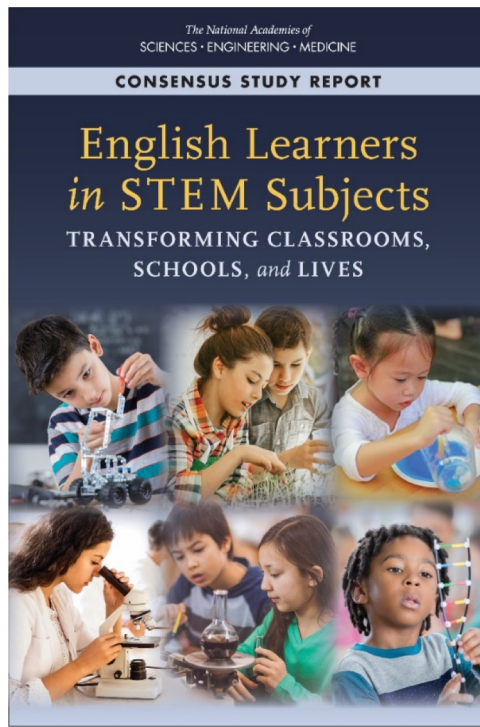


*In a classroom there were children from different parts of Latin America, and one mother asked the teacher, “How is my child doing?” and the teacher replied, “Perfect. He is very disciplined. He rarely talks. He is a model child.” But, you know what? I want to tell you something that it’s very important; when you have a student who is an immigrant, for you to look closely, to talk with him/her, to communicate in his/her cultural and family context, because the perfect child who didn’t talk, who didn’t participate, who was very disciplined, was all because he didn’t understand a bit of English.
[Marisol, Parent Panel]*



English Learners in STEM Subjects: Transforming Classrooms, Schools, and Lives

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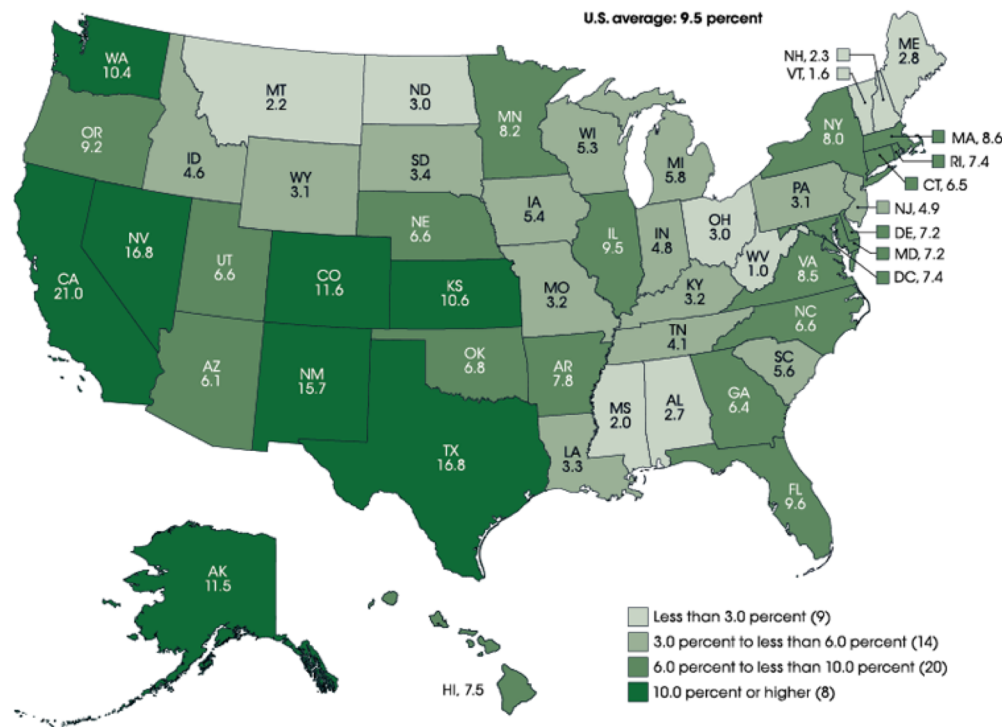


- ELs preK-12th grades
 - Promising approaches to support ELs in learning STEM
 - Role of teachers
 - Assessments in STEM
 - Policies and practices
 - Gaps in current research base
- Role of Families & Communities

Definition and Distribution of ELs

(Data from Fall 2016)

Percentage of public school students who were ELs by state;
9.5% of student population is ELs (4.8 million students)



Federal Law defines ELs as:

- 3–21 years old enrolled in elementary/secondary school
- Native language not English
- Proficiency may limit or deny ability to achieve in English-only classrooms

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD) See *Digest of Education Statistics 2017*, [table 204.20](#).

Current State

- Conventional roles include
 - checking homework
 - attending open houses
 - participating in parent-teacher conferences
 - joining PTAs

Position caregivers as needing ‘remediation’ in supporting child’s educational success

- Community-based reform highlight role of community & family through
 - culture & linguistic repertoires
 - lived experiences
 - social & economic ‘funds of knowledge’
 - disciplinary understandings & ways of knowing

Topics Covered

- Positioning of ELs & views of home culture
 - Traditional models for family engagement
 - Professional learning for positive impacts
 - Research on building stronger connections
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- Conclusions, Recommendations, Additional Research needed

Positioning of ELs

What research tells us:

- Classroom practice creates disconnect w/ways of knowing ELs bring to school & “objective, privileged ways by an intellectual elite”
- Students routinely treated as homogeneous → “one size fits all” mentality
- Assumption of equal access & opportunity for learning

Disciplinary Practice & Culture

Conflict(s) observed:

- Questioning & inquiry → not encouraged in some cultures
- Autonomy → respect for teacher's authority
- Collaboration & independence → preference for group decision making

Transform:

- Discourses & practices to “knowledge-in-the-making”
- Identities that leverage home & resources as legitimate tools for learning
- Spaces that allow for more student agency

Example

A third grade teacher about her experiences with children, recent immigrants who do not yet know English well:

I have one little girl here who started in September, and she's really good at doing a lot of math. She's really good at math and she knows that's her strength.... So when I ask her "ok Elisa in your group you're going to be the one sharing over here," she'll do it in Spanish and then she'll turn around and she'll look at me like "can you please translate for me so that they'll understand what I'm talking about?" ... and the kids say "Elisa, Elisa, come this way" because Elisa shares.

Teacher's Views of Home/Family Context

Mathematics Education of English Learners Scale (MEELS) → Surveyed 215 preservice teachers

- 42% agreed or strongly agreed that some ELs' home culture negatively impacts math learning
- 85% agreed or strongly agreed that, in general, parents from some cultures place higher value on education than parents from other cultures
- 33% agreed or strongly agreed that ELs from some ethnicities are inherently better at math than ELs from other ethnicities

Traditional Models of Family Engagement

Caregivers as 1st Teachers: Early Learning Programs for Ages 0-5

- Federally funded programs designed to assist caregivers to prepare children for ed success → programs dictated practices

Caregivers as Learners: Family Literacy Programs

- Caregivers to be bearers of knowledge → program designed based on deficit assumptions about families & cultural practices

Caregivers as Partners: Partnerships, Contracts, & Compacts

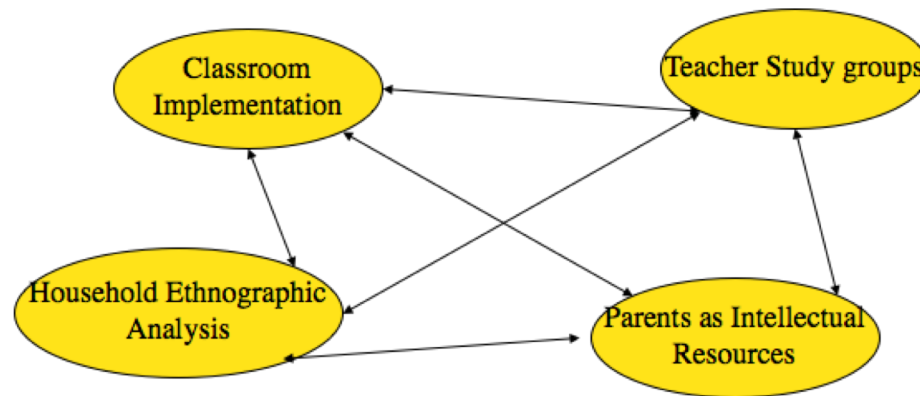
- Schools/districts share info w/caregivers on school programs, academic standards & assessments → “knowledge partners”

Caregivers as Chooser & Consumers: School Choice

- Caregivers make choices → choices constrained by structural inequalities

Empowerment Approaches

Funds of knowledge as a powerful approach



Impact of household visits

Based on the one home visit, I know what the student does in her family. And what the family does. It makes me more sensitive to asking questions that I know she knows the answers to. It is great. She is now participating more in class. (Teacher)

I guess realizing that the home is a real learning place, real learning environment, you know, I didn't think it was so much a learning environment as it is. (Teacher)
(Civil & Andrade, 2002)

The construction module

Second grade classroom- teacher had the students in first grade- did home visits (funds of knowledge)

School: about 50% Mexican American; 40% Yoeme; 10% Anglo

From the teacher

The planning of this module was often frustrating. I knew my academic objectives, but I was not exactly sure how I would make them into this theme.... I felt that I was in a state of uncertainty, yet I still had to cover certain areas of the curriculum. I had to make sure that my students learned the strategies and skills to be academically successful.
(Sandoval-Taylor, 2005, p. 162)

In looking back I realize that, given the current context of high-stakes testing and scripted curriculum, my students were catapulted to higher levels of literacy and numeracy because I had provided them with multiple access to the content.... My students flourished in ways that I did not expect. I believed my students had internalized what they were learning because what they brought from home surrounded and supported their learning. (Sandoval-Taylor, 2005, pp 162-163)

What I do advocate, ..., is that teachers become acquainted with their students through an ethnographic, not just a teacher, lens in order to get beyond a superficial and stereotypical familiarity with them.... This process gives students and their families a sense that their experiences are academically valid (Amanti, 2005, p. 138)

Building Stronger Connections

- Language of instruction could be a barrier
 - Bilingual education settings allow caregivers to be more engaged & help w/homework
 - Bilingual family workshops could increase confidence w/parent-teacher interactions, strategies to advocate for children, stronger connections w/other caregivers
- Leverage informal learning experiences
 - Activities interactive & multifaceted → acknowledge families' cultural practices

Language Policy

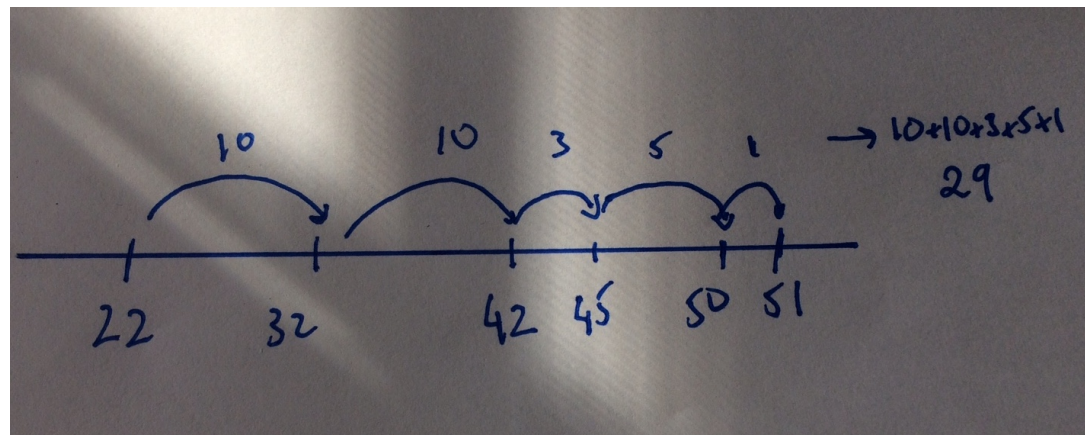
- *I liked it while they were in a bilingual program, I could be involved... When he was in kindergarten it was easy to cut out things, pass out the projects to the kids, gather them up, I even brought work home to take for the teacher the next day. In first grade it was the same thing, I went with him and because the teacher spoke Spanish, she gave me things to grade and other jobs like that. My son saw me there, I could listen to him, I watched him. By being there watching, I realized many things. And then when David went to second grade into English-only and with a teacher that only spoke English, then I didn't go, I didn't go.*
[Verónica]

Some avenues to building stronger connections

- Funds of knowledge home visits (teachers)
- Parents' visit to a mathematics classroom

A 2nd grade classroom visit

- [they were doing subtraction using the “frog method”]
- To do for example $51 - 22$, one could do from 22 to 32, it's 10 (first frog jump), then to 42, another 10 (so that's 20) and then maybe 3 more to 45 (so that's 23) and 5 more to 50 (so that's 28), and then one more, so the answer is 29



That thing about the little frog and that... At the beginning, when I would look at it, I would say, “Well, what are they...? How did they do it?” And I would get stuck there.... For example, right now, to me they could have done that problem easier, and not so much... [Moves her hand as if taking many steps]. And, for example, well, you just subtract and do the subtraction and that’s it, but they, they extended it a lot. [Adriana]

About the workshops with parents

- It is NOT about teaching them their children's school math... that's only one part... it's about themselves as learners and about us (teachers / researchers) learning from them.
- *If I fared well I would understand. If not, I would tell my daughter, "Well, do it yourself." [Laughter] But I would feel that the girl would say, "Well, my mom doesn't know," so I decided to take the time to come to the classes [Adriana]*

- *I am so happy with all these mathematics workshops because I realize how to help my children understand mathematics in a different way, from a fun approach, all together as a family. ... And also for us, because one never knows when we may need it, and this way we move forward, and no one is going to mandate that is has to be the way they say, because we also think and solve problems.*

- *[This project] has been very different from my previous experience with math. I went through my whole life being told how things were and not given any freedom to figure it out on my own. Being able to experiment with blocks or whatever is much more interesting.*
- *At home, all my family becomes involved in my math homework, from my husband to my youngest child. As soon as I take my notebook, they come to the table. [Esperanza]*

A setting for dialogue

Mexico

$$\begin{array}{r} 29 \\ 42 \overline{) 1224} \\ \underline{384} \\ 6 \end{array}$$

U.S.

$$\begin{array}{r} 29 \text{ r } 6 \\ 42 \overline{) 1224} \\ \underline{- 84} \\ 384 \\ \underline{- 378} \\ 06 \end{array}$$

- A mother commenting on the approach to division in the U.S:

When I looked at how he [her son] was dividing, he subtracted and subtracted and that he wrote the whole equation, I said “what teacher wants to make things complicated; no, son, not that way! This way!” And he learned faster this procedure. I say that the first barrier is visual, we as parents don’t speak English or we don’t understand English. ... but if visually you see such a mess. [Marisol] (Civil & Planas, 2010)

*Last night my son said to me that school from Mexico was not valued the same as school here, that is, it doesn't count. What I studied there doesn't count here He knows that what is taught here is different from what is taught there and so he says, "why would I ask my mom for help if she's not going to know?" So, there is a barrier.
[Mónica]*

- It should not be about having to learn the “school method” and rejecting the “home method”
- Children (and in particular children of immigrant backgrounds) should not be asked to have to choose.
- It has to do with whose knowledge is valued.
- We need better communication between schools and families; an authentic two-way dialogue.



Conclusions, Recommendations, & Additional Research Needs

Conclusions

- Teachers play critical role in positioning ELs as competent learners & this can influence ELs' classroom learning → positive expectations lead to more meaningful learning opportunities
- Teachers that engage w/families more likely to have an appreciation for cultural & linguistic differences & work to improve communication & understanding
- Caregivers want their voices & experiences heard & validated by teachers & schools → enjoy learning math & engaging in discussions about content and teaching
- Little research on specific family-school interactions & learning outcomes → efforts generally yield positive benefits for students, families, and schools

Recommendation

Encourage & facilitate engagement w/stakeholders in ELs' local environment to support STEM learning

- Schools & districts should reach out to families & caregivers → understand available instructional programs, community resources, & different academic/occupational opportunities
- Schools & districts should collaborate w/community organizations & form external partnerships that focus on informal learning → make active effort to directly engage ELs & caregivers to understand families' & communities' assets/needs

Research Needs

- Can research-practice partnerships & other collaborative research models be leveraged to identify elements of the school-home-community system that are working well & elements that are not?
- Under what conditions are schools successful at building deep & lasting partnerships w/families & communities that have positive impacts on those students' learning?
 - How can shared [STEM] learning experiences both in & out of school contexts support EL students & their families in gaining knowledge about & motivation toward [STEM] academic & occupational pathways?

A few take-aways

- Parental engagement (“involvement”) may look different from what schools expect, yet it is engagement.
- Parents want to be heard and share their experiences / knowledge of mathematics.
- Parents enjoy learning mathematics as adult learners and bring this learning to their family.
- Parents (like everybody else) have strong beliefs about the teaching and learning of mathematics and (different) expectations about their role / role of teacher.
- Language policy affects parental engagement and their interaction with their children.

From two mothers

- *Because we are all a family....They have our children all day. We are somehow related and I think that if we break those barriers, you'll see, I think everything will work better. ... the foundation of everything is the communication that the school wants to do with the parents. If that family is never really built, I think that it will not be reflected on... Because if a school is doing well, it's because there is a good relationship with you. [Carlota]*
- *Teachers need to understand that parents and children come together. [Marisol]*

Information about EL STEM project:

<http://nas.edu/ELinSTEM>

Access to all National Academies publications:

www.nap.edu

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