Designing Playful STEM Learning in School and Community Spaces

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School of Education



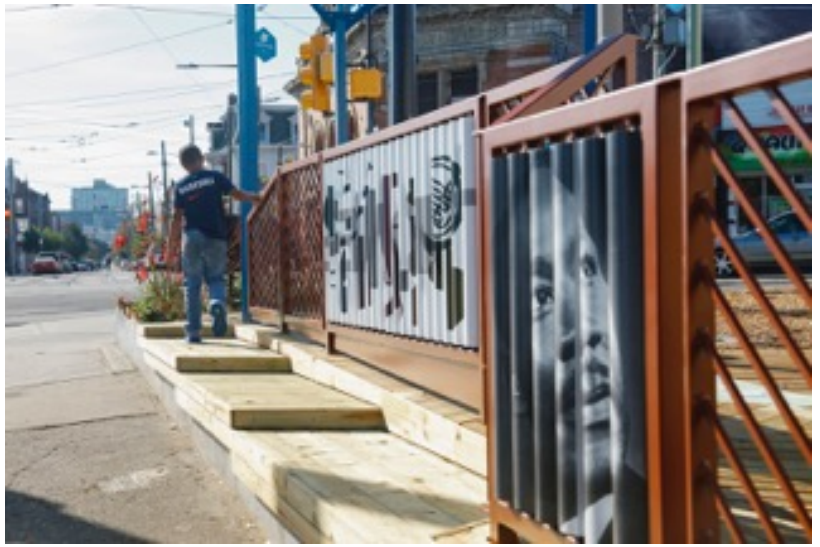
PLAYFUL Learning LANDSCAPES



Children spend 80% of their time outside of school and early learning centers.

PLAYFUL Learning LANDSCAPES









Bustamante et al., 2020.
Developmental Psychology.

Hassinger-Das, et al., 2020.
Journal of Cognition & Development.

Bustamante, Hassinger-Das, Hirsh-Pasek, & Golinkoff, 2019.
Child Development Perspectives.

Ridge et al., 2015.
Mind, Brain, & Education.

Stimulating STEM in the City: Co-Designing with Latine Families to Promote Informal STEM Learning

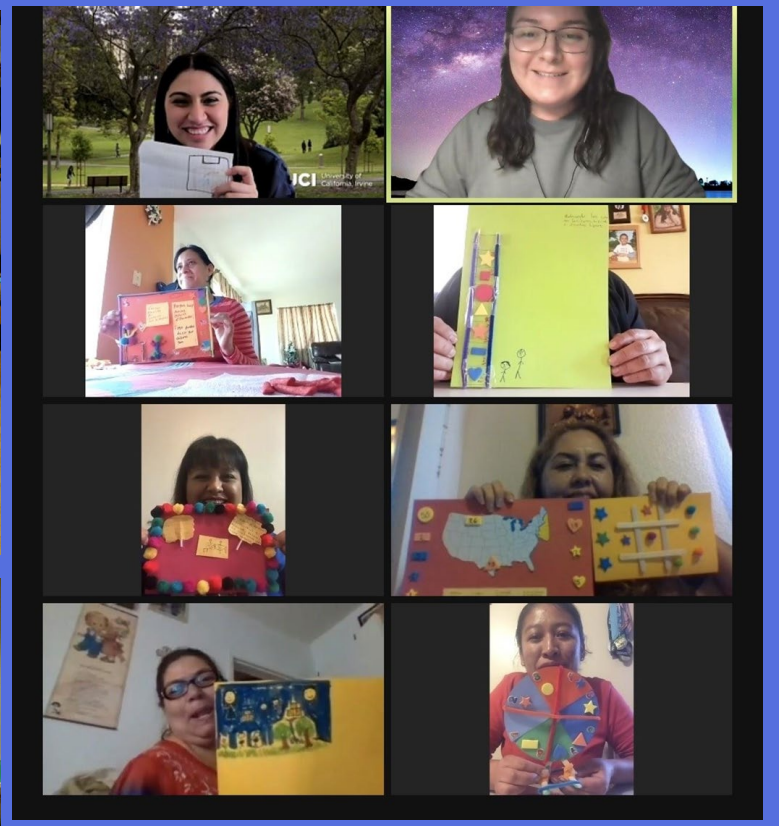




Community Co-Design











Sus valores comunitarios/*Your community values*

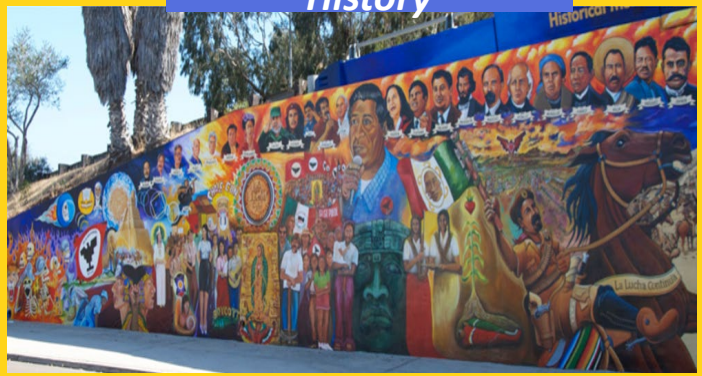
Union Familiar
Family Unity



Cultura
Culture



Historia
History



Aprendizaje Intergeneracional
Intergenerational



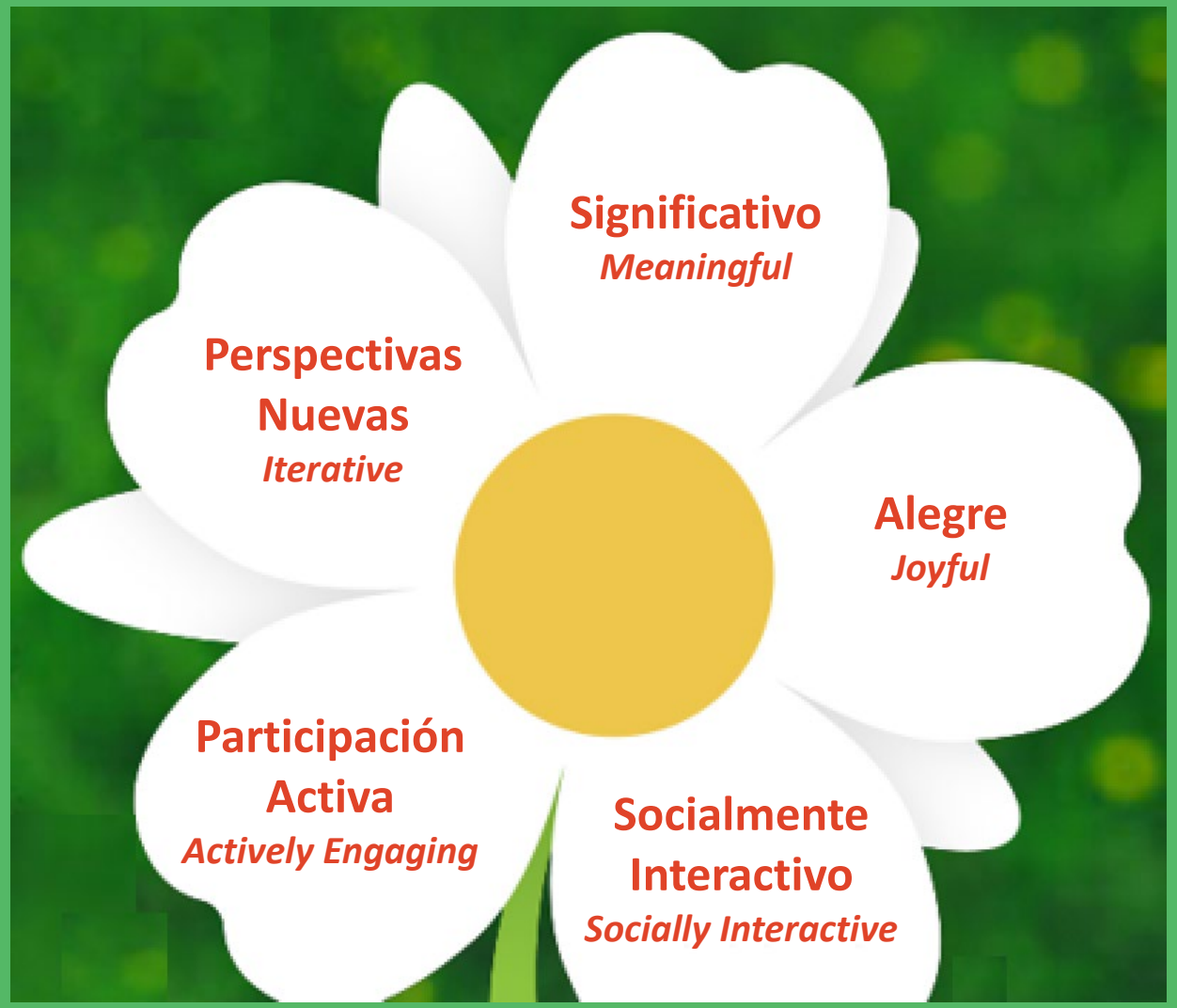
Atractivo
Attractive



Seguro y Relajante
Safe and Relaxing



Learning Principles & Goals



Prácticas y Conceptos de la Ciencia en la Edad Temprana

Early Science Practices and Concepts

Haciendo Observaciones/
Making Observations

Haciendo Preguntas/
Asking Questions

Haciendo Predicciones/
Making Predictions

Construyendo Explicaciones/
Constructing Explanations

Patrones/
Patterns

Causa y Efecto/
Cause and Effect

Escala, Proporción, y Cantidad/
Scale, Proportion, & Quantity

Belgrave et al., & Bustamante, (2022)

Journal of Applied Developmental Psychology

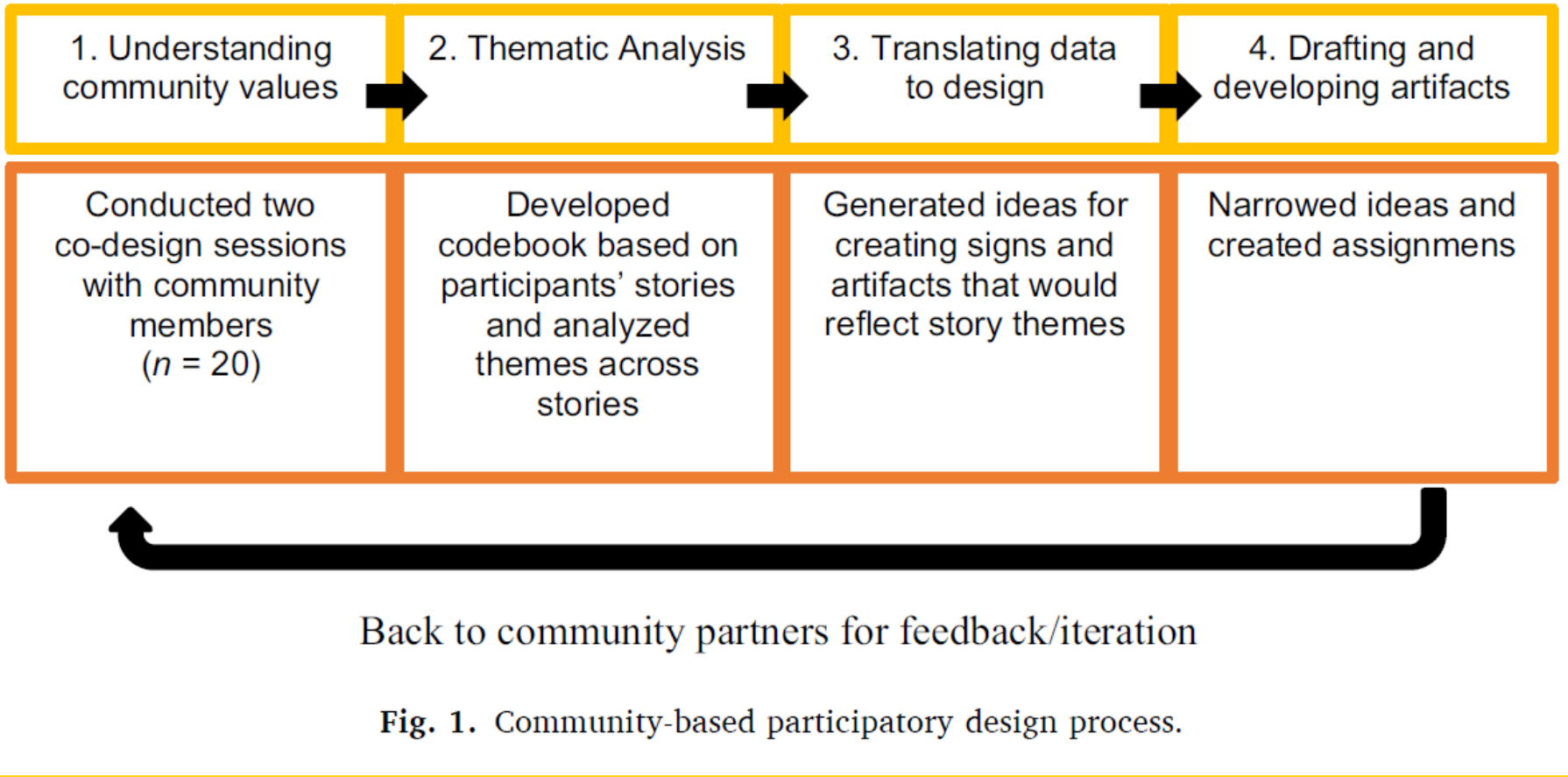
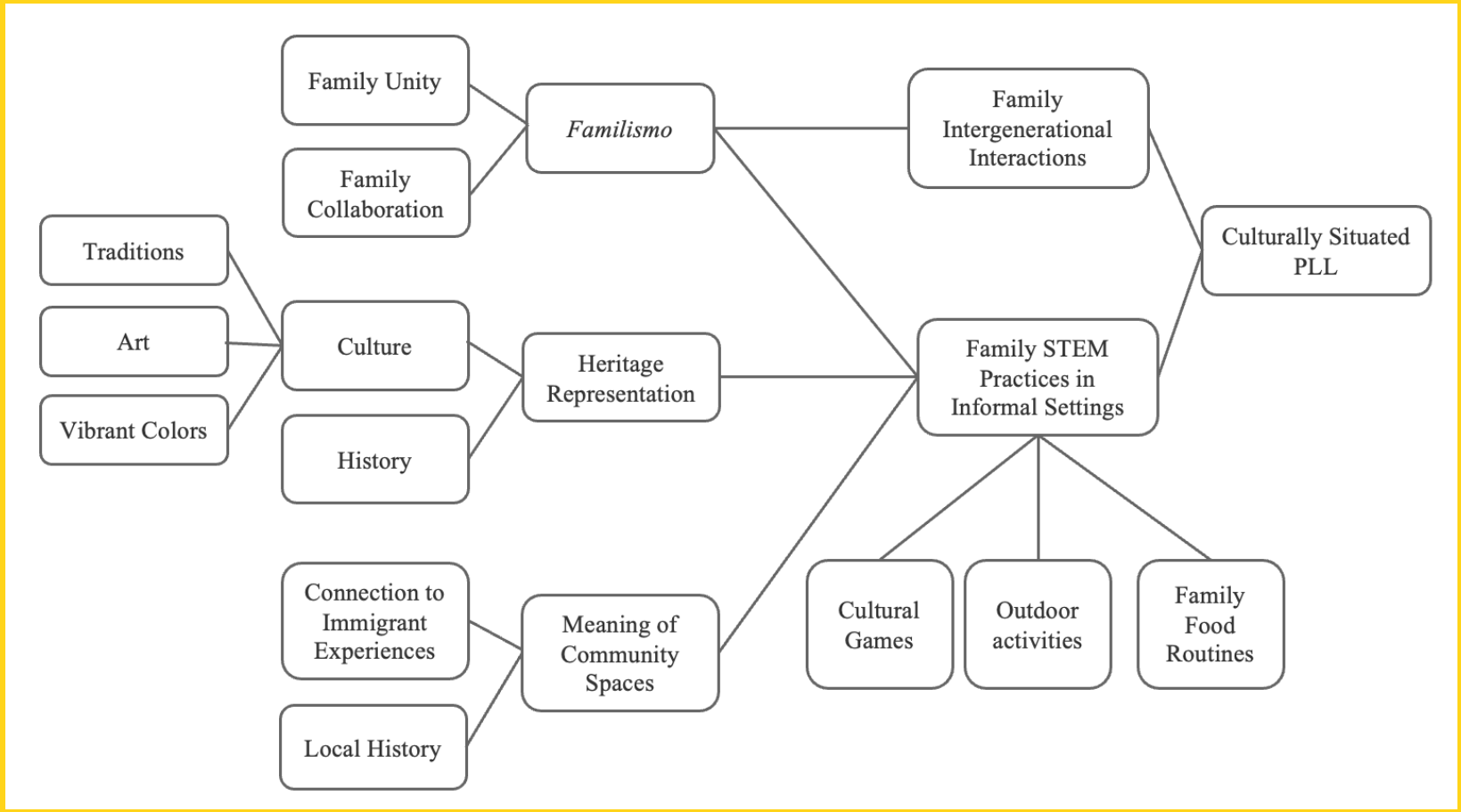


Fig. 1. Community-based participatory design process.



Bermudez et al., & Bustamante, (2023)

Early Childhood Research Quarterly






HAPPY BIRTHDAY
GIFT CARDS
¡ESPERA! WAIT!
Antes de pesarlo, ¿cuánto crees que pesa?
Before weighing it, how much do you think it weighs?
lb
kg
Después de pesarlo, ¿cuánto pesa?
After weighing it, how much does it weigh?
¿Qué tan cerca estuviste? How close were you?
¡Intenta con otro producto! Try again with another item!
UCI School of Education
1.69 LB


LIBRAS
POUNDS
0.00 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.00 lb
KILOGRAMOS
KILOGRAMS
0.00 0.11 0.23 0.34 0.45 0.57 0.68 0.79 0.90 1.02 1.13 1.25 1.36 kg
¿Cuántas libras / kilos pesa tu producto?
How many pounds / kilos does your item weigh?
UCI School of Education
Learning
Early Learning Initiative
Hecho con LECHE ENTERA
Made with 100% WHOLE MILK
AGUA BLANCA
COTIJA CHEESE
Cotija Cheese Agua Blanca
4998
$ 7.99 LB


¿Cómo encuentras la mejor fruta o vegetal?
How do you pick the best fruit or vegetable?
HUELE
SMELL
VE
SEE
OYE
HEAR
PRUEBA
TASTE
TOCA
TOUCH
¡Comparte tus consejos!
Share your tips:
UCI School of Education
Early Learning Initiative


Yo Veo
SANTA ANA
ENCUENTRA CINCO DE CADA ARTÍCULO ABAJO
COTORRO VERDE
GATO DORMIDO
GLOBO SOLO
CACTUS
MARIPOSA
SÍMBOLO AZTECA
CAMPANA
NIVEL EXPERTO
ORUGA×3
TACO×5
HORMIGA×
MUSEO BOWERS
El Toro
YOST
YOST
Yo Veo
SCHOOL BUS
DOWNTOWN
ORANGE COUNTY
Yo Veo
SANTA ANA
ENCUENTRA CINCO DE CADA ARTÍCULO ABAJO
COTORRO VERDE
GATO DORMIDO
GLOBO SOLO
CACTUS
MARIPOSA
SÍMBOLO AZTECA
CAMPANA
NIVEL EXPERTO


SOUTH MAIN STREET
NOROOZ CLINIC FOUNDATION
NON-PROFIT ME EALTH CLINIC
¡Usen el ÁBACO para contar, explorar, y jugar juntos!
Use the ABACUS to count, explore, and play together!
¡Prepárenlo!
Set it up!
¡Muévanlas a la izquierda!
Move them to the left!
¡Muéstren estos números!
Show these numbers!
Miren a su alrededor
Look around...
¡Cuenten lo que ven!
Count what you see!
¡Inventen un juego!
Invent a game!
10,000
1,000
100
10
1
SANTA ANA


¿Cuánto mido de altura ?
How tall am I?
6ft
180cm
5ft
160cm
140cm
4ft
120cm
1m
3ft
80cm
2ft
60cm
40cm
1ft
20cm
¿Puedes encontrar las figuras en los animales?
Can you find the shapes inside the animals?


WELCOME TO
BIENVENIDOS A
Park opolis!
THE LIFE-SIZE BOARD GAME
WHERE KIDS MAKE THE RULES!
BEGIN ON THE "START" SQUARE
ROLL THE DICE TO ADVANCE AROUND THE BOARD
PICK THE CARDS AND PLAY THE FUN ACTIVITIES
HAVE FUN!
¡QUE TE DIVIERTAS!


LA LOTERÍA
CÓMO JUGAR How to Play
¡GIRA LA RULETA!
Spin the wheel!
¡VOLTEA LA TARJETA!
Flip your card!
¡RESPONDE LA PREGUNTA!
Answer the question!
MANERAS DE GANAR Ways
EL MECÁNICO MECHANIC
LA DOCTORA DOCTOR
EL OCÉANO OCEAN
EL SOL SUN
EL MAESTRO TEACHER
EL ÁGUILA EAGLE
EL NOPAL CACTUS
EL GALLO ROOSTER
LA ARQUITECTA ARCHITECT
LA MARIPOSA BUTTERFLY
LOS TACOS TACOS
EL ÁRBOL DE JACARANDA JACARANDA TREE
EL AGUACATE AVOCADO
EL ELOTE CORN
LAS PALETAS POPSICLES
EL LORO PARROT


Bienvenidos
¡Estamos felices de
que estén aquí!
¡Sigan las huellas para
celebrar con nosotros!
Muchas Gracias a nuestros aliados de CalFresh por brindarnos los diseños del piso.











Mixed-Methods Evaluation

FIRST 5 ORANGE COUNTY
CHILDREN & FAMILIES COMMISSION

Observational Protocols

- Language and interactions (quantitative)
- Manifestations of culture (qualitative)

Caregiver Surveys

- Attitudes around play and learning
- Opportunities for STEM learning
- STEM self-efficacy





ORIGINAL RESEARCH article

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Sec. Leadership in Education

Volume 11 - 2026 | https://doi.org/10.3389/feduc.2026.1898497

"Los niños tienen derecho de jugar": exploring Latina mothers' experiences as co-researchers and advocates for playful learning in community spaces

Karlena D. Ochoa [1*] Vanessa N. Bermudez [2] Annelise Pesch [3]

Julie Salazar [4] Wendy Gomez [5] Rigoberto Rodriguez [5,6] June Ahn [4]

Kathy Hirsh-Pasek [7] Andres S. Bustamante [4]



British Journal of Developmental Psychology — the british psychological society

INVITED ARTICLE

Leveraging community science to encourage a more inclusive and culturally representative developmental science

Annelise Pesch, Deena Skolnick Weisberg, Michael Weisberg, Kelly Kennedy, Karlena D. Ochoa, Vanessa N. Bermudez, Julie Salazar, June Ahn, Andres S. Bustamante, Kathy Hirsh-Pasek ... See fewer authors

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Interview

Sustaining Latine Families' Cultural Values Through Technology Mediation Practices

Julie Salazar, Isabella T. Seccia, Jennie V. Maldonado, Laura Hernandez, Vanessa N. Bermudez, Lourdes M. Acevedo-Farag, June Ahn & Andres S. Bustamante ...show less

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