

ILLUMINOLOGY



EDUCATION

EVALUATING THE IMPACT OF *THE WIGGLE JIG* PROGRAM (2019-2020)

May, 2020



CHILDREN SHOW MAJOR IMPROVEMENTS IN THEIR MOTOR CONTROL AFTER PARTICIPATING IN THE PROGRAM. Students showed great improvement, with 91% improving in at least one of the 6 different developmental motor skills, and almost half (45%) showing improvement across all 6 of them. Additionally, every concept showed improvement by at least two-thirds of the children. Together, this suggests that *The Wiggle Jig* is a comprehensive movement curriculum, and that improvement in one facet supports improvement in others.



CHILDREN INCREASE THEIR ABILITY TO SUCCESSFULLY ENGAGE IN MULTI-STEP ACTIONS AND COGNITIONS AFTER PARTICIPATING IN THE WIGGLE JIG. The dance instruction emphasizes the ability to plan, remember, and execute multiple, connected motions. Classroom teachers took note of this, reporting significant improvement over time in the ability of preschoolers who participated in *The Wiggle Jig* to perform multi-step actions and cognitions.



CHILDREN INCREASE THEIR SOCIO-EMOTIONAL SKILLS AFTER PARTICIPATING IN *THE WIGGLE JIG*. The dance instruction emphasizes the ability to understand and communicate with others, and preschoolers taking part in The Wiggle Jig showed significant improvement over time in their ability to recognize and respond to their own and others' emotions.



OVERALL, TEACHERS FIND VALUE IN INCORPORATING DANCE/ MOVEMENT IN THEIR CLASSROOM AND WANT TO DO THIS AGAIN. Classroom teachers commented equally on the emotional impact of the program: helping children express themselves and gain confidence, and the mental impact of the program: improving children's motor skills, coordination, discipline, self-control, and focus.



OVERVIEW OF THE 2019-2020 IMPACT EVALUATION

Overview of The Wiggle Jig Participation in 2019-2020

About our analytic approach

Our key program impact questions

WHAT IS *THE WIGGLE JIG*?

BalletMet's *The Wiggle Jig* is a comprehensive outreach dance program for early childhood students ages three to five. First developed in 2009, *The Wiggle Jig* helps children develop their motor/movement, social/emotional, and executive functioning and cognitive skills, all in the context of supporting healthy childhood development.

Aided by generous financial support from PNC Bank and other funding sources, BalletMet works with a variety of organizations to bring *The Wiggle Jig* to the community. The comprehensive programming includes 10 weeks of dance classes (one class per week) taught by two dance educators and an accompanist, professional development for teachers, tours of BalletMet's dance center, the literacy companion book *Leap and Twirl* written specifically for the program, and an evaluation protocol.



Photo Credit: Jennifer Zmuda



Photo Credit: Jennifer Zmuda

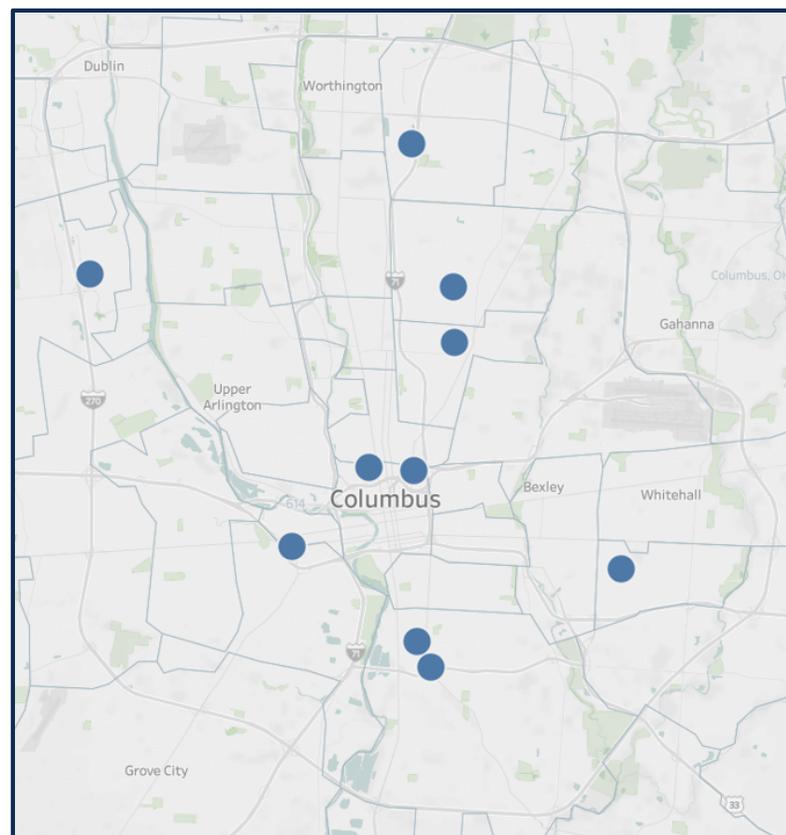
A Quick Overview Of *The Wiggle Jig's* Activities In 2019-2020

The Wiggle Jig's programming was delivered in 10-week blocks across three educational sessions: Summer 2019, Fall 2019, and Winter 2020. The Spring quarter was cancelled due to the COVID-19 crisis.

During that period, a total of **26 preschool classes** at **10 sites across central Ohio** received *The Wiggle Jig* programming. These sites included early childhood programs at Head Start centers, Columbus City Schools, Southside Early Learning, and The Childhood League Center.

Overall, **437 preschool children** participated in a 10-week *The Wiggle Jig* session during the 2019-2020 period.

Map Of *The Wiggle Jig* Sites (2019-2020)





Measuring *The Wiggle Jig's* Impact On Children

Research Methods: Blending Behavioral Observations And Subjective Ratings

(1) Movement Rubric. This tool measured children's ability to control their breathing and their bodies as they move and communicate through dance.

- Across the three sessions, BalletMet instructors completed 411 rubrics at session start (i.e., the "pre" measurement) and 313 rubrics at session end (i.e., the "post" measurement).
- Overall, 308 students had both pre and post movement rubrics completed.

(2) Teacher Survey. This tool measured the extent to which children were able to recognize and respond to their own and others' emotions (socio-emotional development), follow multi-step directions and tell stories with logical links (cognitive control), demonstrate restraint/self-regulation, and other concepts.

- Across the three sessions, classroom teachers completed 412 surveys at session start (i.e., the "pre" measurement) and 342 surveys at session end (i.e., the "post" measurement).
- Overall, 321 students had both pre and post teacher survey data.

Note: The different numbers of pre and post measurements is due to student attrition and to the transient nature of some of the student populations served by *The Wiggle Jig*.



About Our Analytic Approach

When analyzing data recorded by the movement rubric and the teacher survey our analyses focus on those children for whom we have pre and post data. By tracking the same child over the 10-week period, BalletMet can have a more accurate and sensitive measurement of program impact on their motor skills, socio-emotional control, and cognitive control, given the data available.

The reader should bear in mind a few caveats about this program evaluation effort:

- The students who participated in the summer session were graded on a different movement rubric than students who participated in the fall and winter sessions. Therefore, the movement rubric data from the summer session are excluded from this report.
- An ideal program evaluation would compare the motor skills, socio-emotional control, and cognitive control of those children who receive *The Wiggle Jig* programming to children who did not (i.e., a control group). Unfortunately, because research designs that incorporate random assignment to control vs. treatment groups are resource and effort-intensive, this was not possible to do. This means we cannot say that *The Wiggle Jig* caused changes in children's motor, socio-emotional, or cognitive skills - only that *The Wiggle Jig* may have contributed to such changes.



Our Key Program Impact Questions



Did participating children increase their motor development skills?



Did participating children increase their socio-emotional skills?



Did participating children increase their cognitive skills?



Did participating classroom teachers find value in the program?

THE WIGGLE JIG'S IMPACT ON CHILDREN'S MOTOR DEVELOPMENT



Did participating children increase their motor development skills?



Description Of BalletMet's "Movement Rubric"

The Wiggle Jig uses an adapted version of Dr. Martha Eddy's Pre-K Animal Moves Rubric, which was developed for BalletMet to detect changes in children's motor skills. This instrument measures the extent to which each child successfully completes actions representing the following concepts:

- **BREATH**

- Action example: Relaxed breathing | Animal movement example: Jellyfish

- **CORE-DISTAL (WHOLE BODY)**

- Action example: Open-close | Animal movement example: Starfish

- **HEAD-TAIL (SPINAL)**

- Action example: Flexion & extension of the spine | Animal movement example: Snake

- **SYMMETRICAL UPPER-LOWER BODY HALVES**

- Action example: Same action with both arms or both legs | Animal movement example: Frog or Rabbit

- **RIGHT-LEFT BODY HALVES**

- Action example: Same side arm & leg | Animal movement example: Lizard (on belly) or Bear (quadruped)

- **CROSS-LATERAL OPPOSITION DIAGONAL**

- Action example: Opposite arm & leg | Animal movement example: Monkey

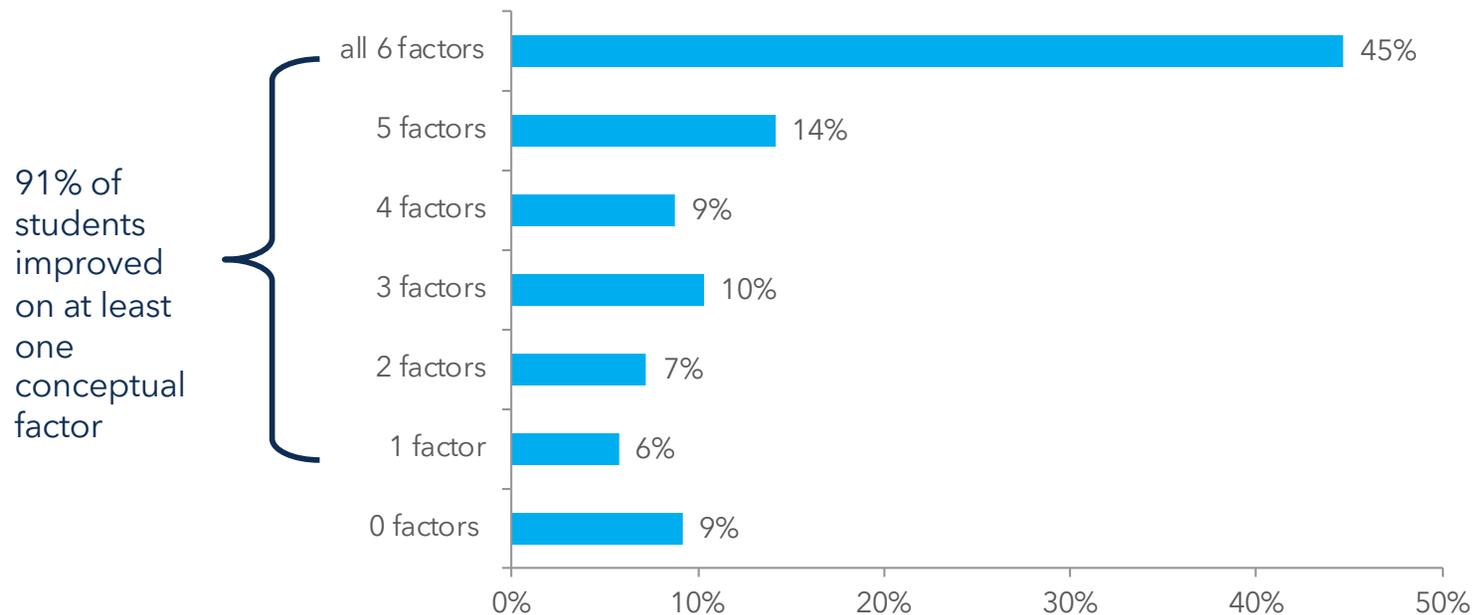


Major Improvements In Motor Control After Program Participation

Students showed great improvement, with 91% improving in at least one of the 6 different developmental motor skills, and nearly half showing improvement across all 6 of them. Additionally, every concept showed improvement by at least two-thirds of the children.

Overall, these findings suggest this is a comprehensive movement curriculum, and that improvement in one facet supports improvement in others.

Proportion of students showing improvement



n=262

THE WIGGLE JIG'S IMPACT ON CHILDREN'S MOTOR DEVELOPMENT

Breath

The "Breath" concept focuses on the developmental motor skill of relaxed breathing and self-regulation of emotional state. (movement example: jellyfish).

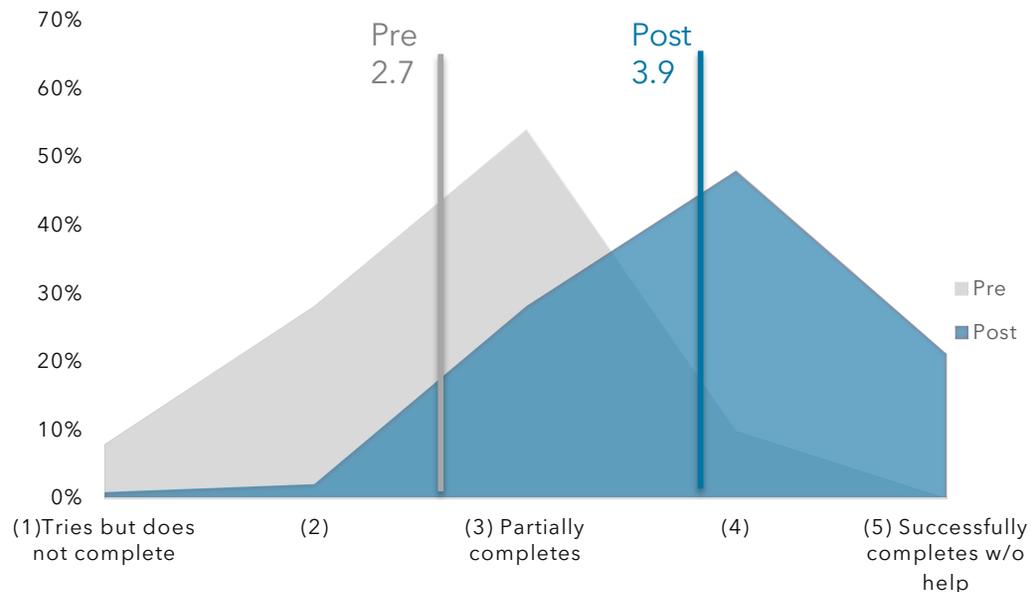
Percentage of preschoolers who improved (overall) on measures of this concept:

67%



Photo Credit: Jennifer Zmuda

Measuring preschooler improvement on this concept from pre- to post-



The graph to the left shows the distribution of average ratings for the overall Breath rubric measurement both before the 10-week program (light grey) and after (dark blue). The average rating (vertical lines) moved away from lower/worse scores of "Tries but does not complete" and toward higher/better ratings of "Successfully completes."

THE WIGGLE JIG'S IMPACT ON CHILDREN'S MOTOR DEVELOPMENT

Core-Distal (Whole Body)

The "Core-Distal" concept focuses on the developmental motor skill of opening and closing actions using the whole body (movement example: starfish).

Percentage of preschoolers who improved (overall) on measures of this concept:

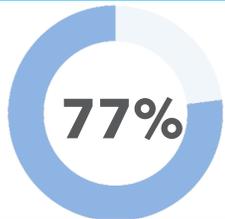
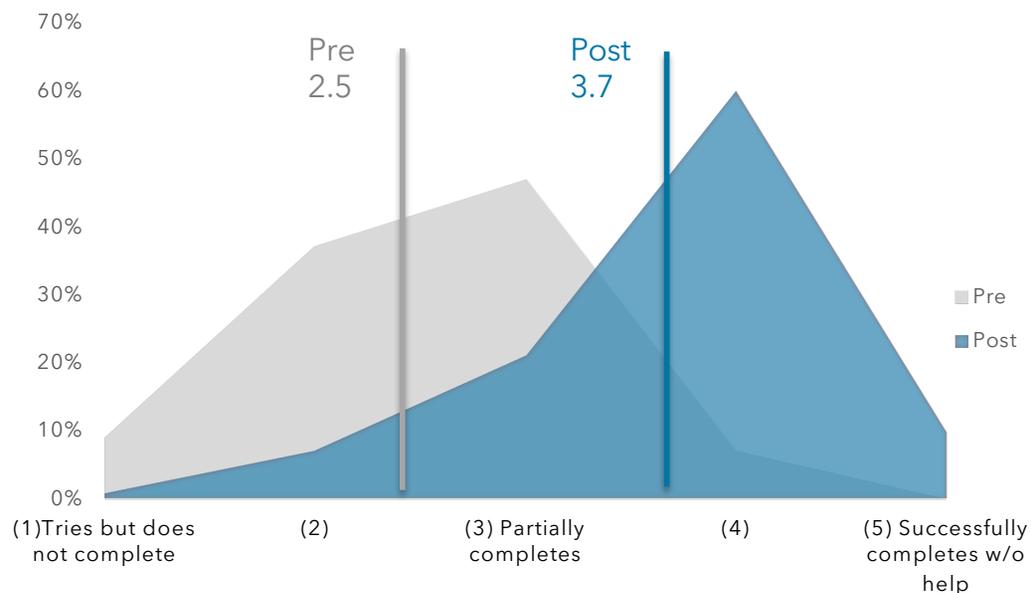


Photo Credit: Jennifer Zmuda

Measuring preschooler improvement on this concept from pre- to post-



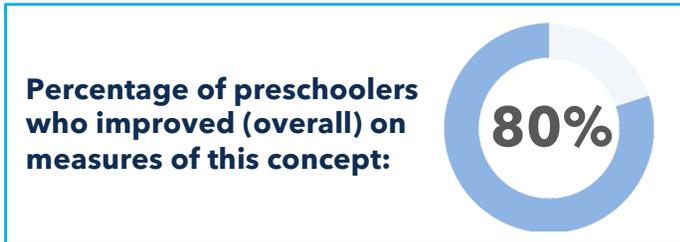
The graph to the left shows the distribution of average ratings for the overall Core-Distal rubric measurement both before the 10-week program (light grey) and after (dark blue). The average rating (vertical lines) moved away from lower/worse scores of "Tries but does not complete" and toward higher/better ratings of "Successfully completes."

n=252

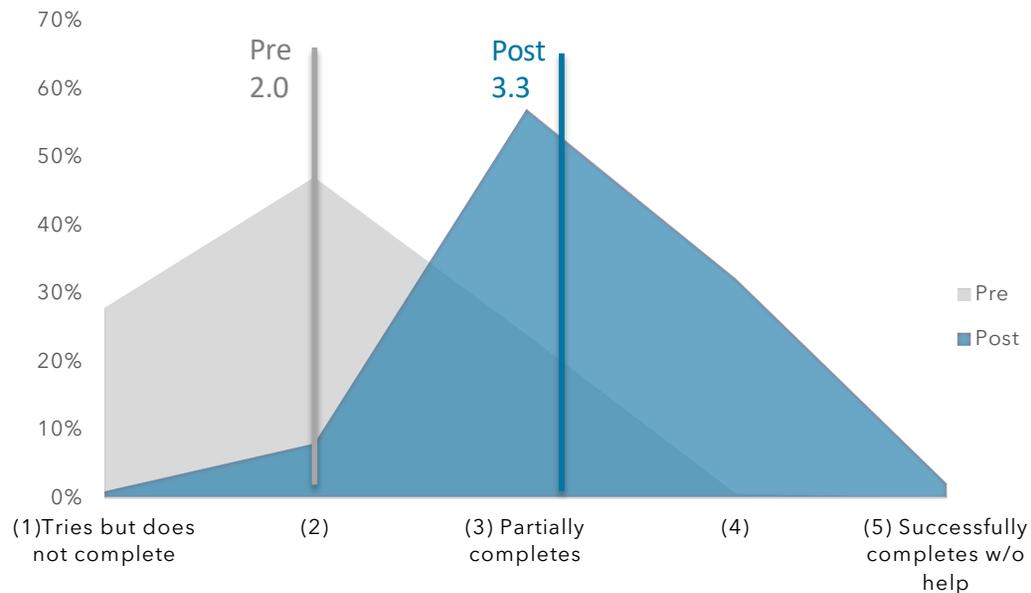
THE WIGGLE JIG'S IMPACT ON CHILDREN'S MOTOR DEVELOPMENT

Head-Tail (Spinal)

The "Head-Tail" concept focuses on the developmental motor skill of spinal flexion and extension (movement example: snake).



Measuring preschooler improvement on this concept from pre- to post-



The graph to the left shows the distribution of average ratings for the overall Head-Tail rubric measurement both before the 10-week program (light grey) and after (dark blue). The average rating (vertical lines) moved away from lower/worse scores of "Tries but does not complete" and toward higher/better ratings of "Successfully completes."

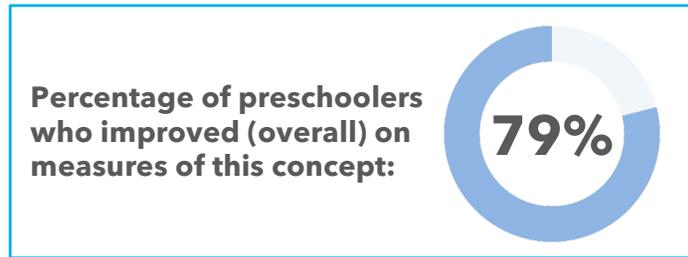
THE WIGGLE JIG'S IMPACT ON CHILDREN'S MOTOR DEVELOPMENT

Symmetrical Upper-Lower Body Halves

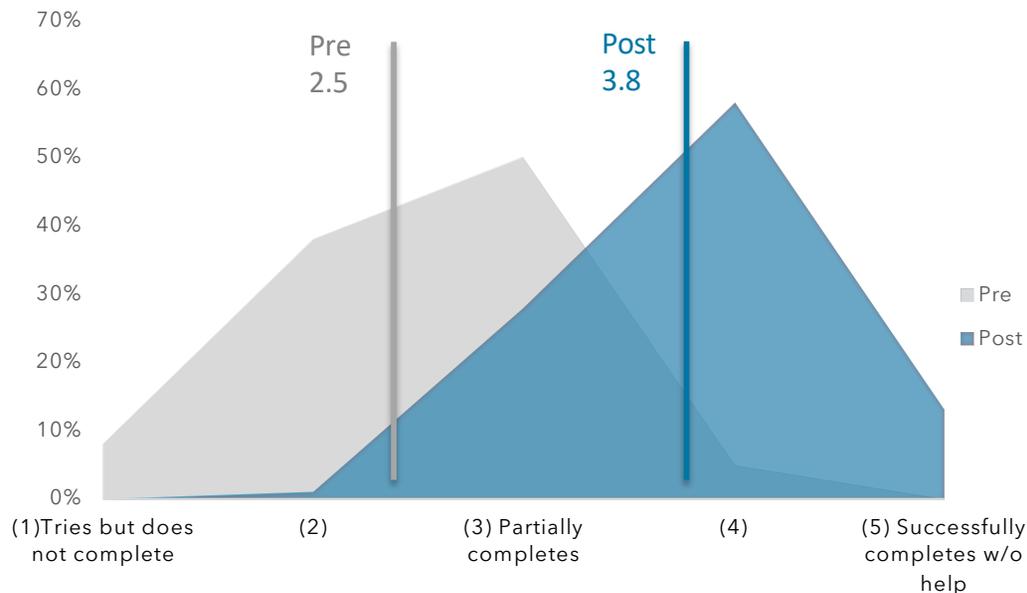
The "Symmetrical" concept focuses on the developmental motor skill of completing the same action with both arms or both legs (movement example: frog or rabbit).



Photo Credit: Jennifer Zmuda



Measuring preschooler improvement on this concept from pre- to post-



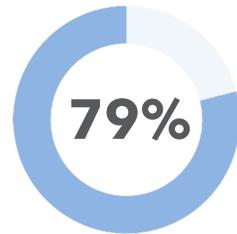
The graph to the left shows the distribution of average ratings for the overall Symmetrical rubric measurement both before the 10-week program (light grey) and after (dark blue). The average rating (vertical lines) moved away from lower/worse scores of "Tries but does not complete" and toward higher/better ratings of "Successfully completes."

Right-Left Body Halves

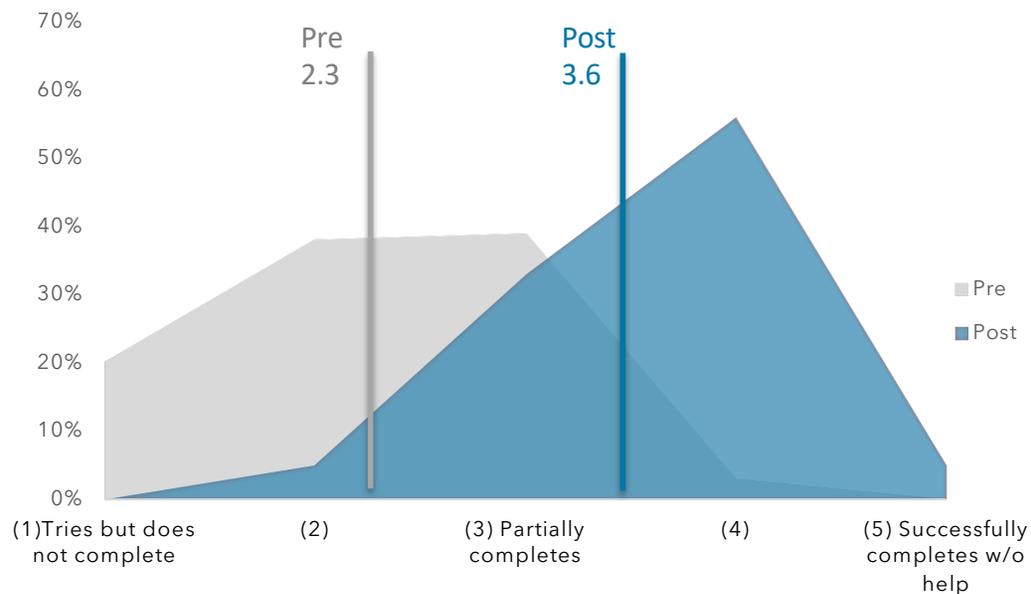
The "Right-Left" concept focuses on the developmental motor skill of using the same side arm and leg (movement example: lizard or bear).



Percentage of preschoolers who improved (overall) on measures of this concept:



Measuring preschooler improvement on this concept from pre- to post-



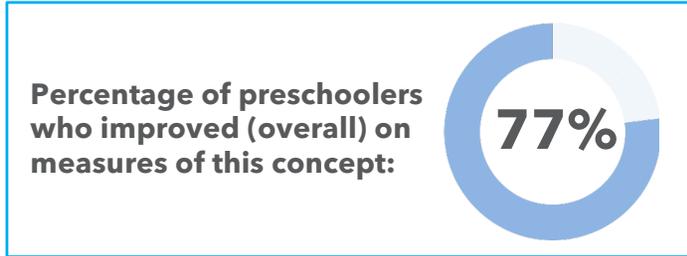
The graph to the left shows the distribution of average ratings for the overall Right-Left rubric measurement both before the 10-week program (light grey) and after (dark blue). The average rating (vertical lines) moved away from lower/worse scores of "Tries but does not complete" and toward higher/better ratings of "Successfully completes."

Cross-Lateral Opposition Diagonal

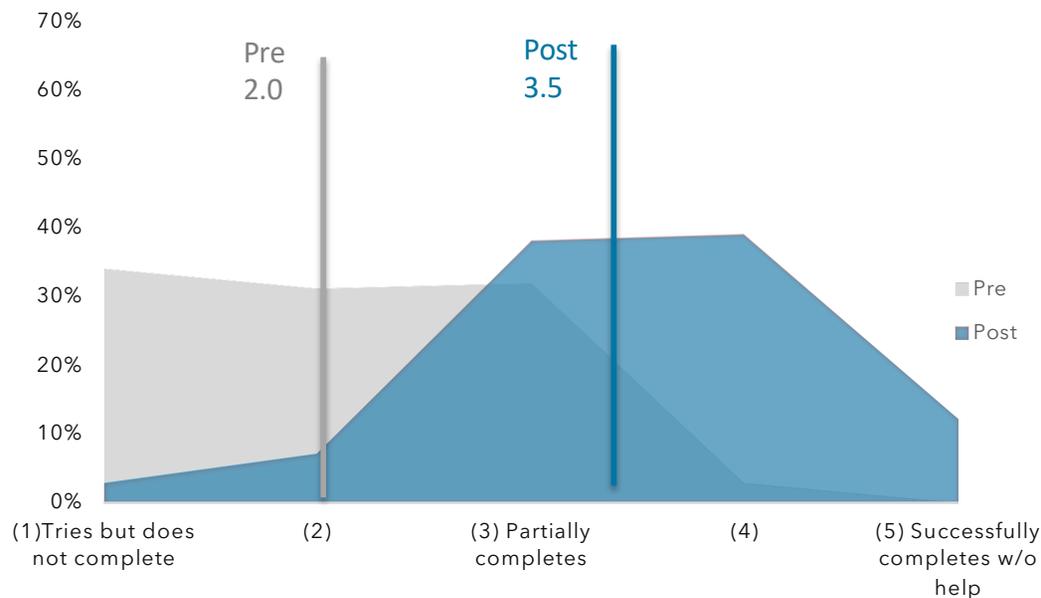
The "Cross-Lateral" concept focuses on the developmental motor skill of using opposite sides of the body to work together (movement example: monkey).



Photo Credit: Jennifer Zmuda



Measuring preschooler improvement on this concept from pre- to post-



The graph to the left shows the distribution of average ratings for the overall Cross-Lateral rubric measurement both before the 10-week program (light grey) and after (dark blue). The average rating (vertical lines) moved away from lower/worse scores of "Tries but does not complete" and toward higher/better ratings of "Successfully completes."

THE WIGGLE JIG'S IMPACT ON CHILDREN'S MULTI-STEP ACTIONS AND COGNITIONS



Did participating children increase their cognitive abilities?



Measuring “Multi-Step Actions And Cognitions”

At the beginning of each session and again at the end, teachers rated each child’s multi-step action and cognition abilities, socio-emotional skills, and other facets of executive functioning.

The domain of executive functioning (EF) is defined as a set of “top-down processes involved in any cognitive work that demands novel thinking, thinking ‘out of the box’, operating in a non-automatic way. They underlie planning, cognitive control, self-control, and sustained attention” (Carey, Zaitchik, & Bascandziev, 2015, p. 41). Also included in EF is working memory, which is defined as the ability to update and monitor information in real time.

This section of the report focuses on the survey items that measure multi-step actions and cognitions, which is a subset of executive functioning, as identified by factor analyses completed during the 2018-2019 evaluation.



Measuring “Multi-Step Actions And Cognitions” (continued)

Preschoolers’ ability to perform multi-step actions and cognitions was measured by teachers’ responses to the following statements.

For each statement, teachers indicated whether the child displayed this ability or behavior... “Never | Once in a while | About half the time | Usually | Always”.

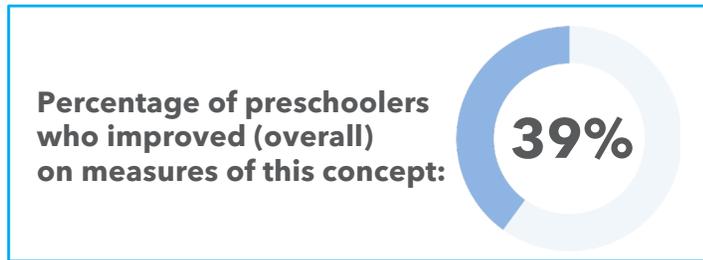
These Statements Reflect This Concept

- Follows and plays games with two step directions (e.g. in a memory game, selects cards and checks if they match) without reminders
- Remembers all steps involved in completing tasks (i.e., does not forget halfway through activity)
- When telling a story, real or fictional, links events in a way that makes sense.
- Can do things that require mental effort (e.g., remembers previous events, correctly answers questions).

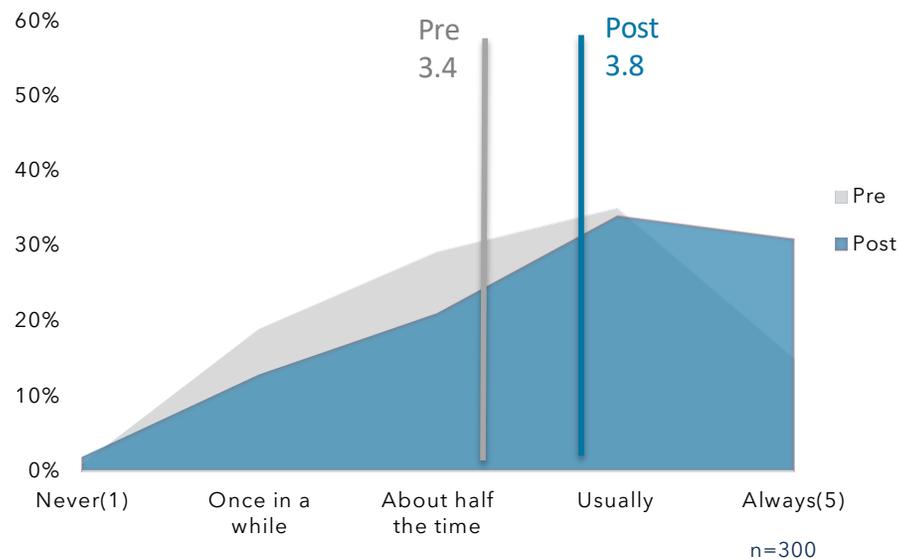


Children Increase Their Ability To Successfully Engage In Multi-Step Actions And Cognitions After Participating In *The Wiggle Jig*

Overall, preschoolers taking part in *The Wiggle Jig* showed significant improvement in their ability to perform multi-step actions and cognitions over time, as rated by teachers. Dance instruction emphasizes their ability to plan, remember, and execute multiple, connected motions.



Preschooler improvement on this overall concept from pre- to post- (★)



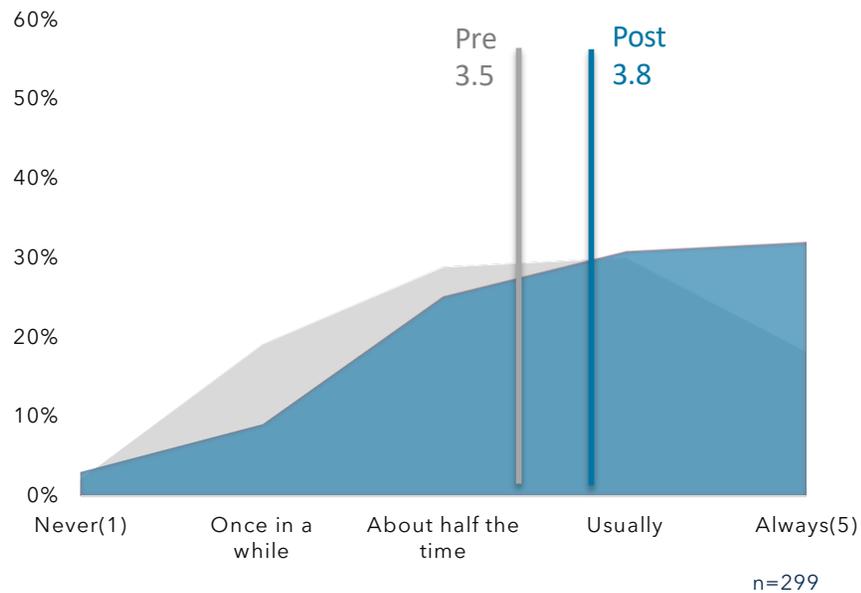
Key: ★ = This pattern is similar to 2018-2019.



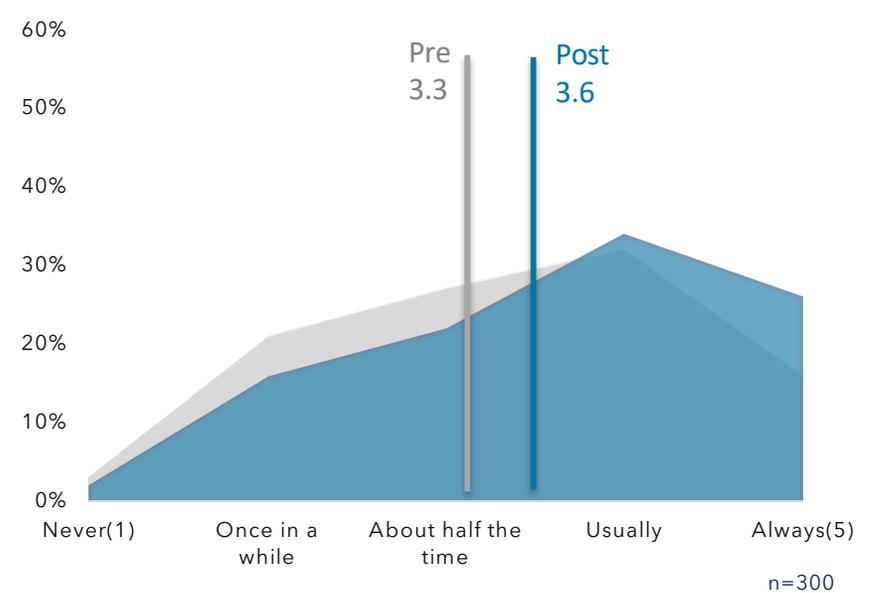
Individual Items

Teachers reported significant increases in how frequently their students linked story events in sensible ways and how often their students were able to do things requiring mental effort.

Follows and plays games with two step directions without reminders (★)



Remembers all steps involved in completing tasks (★)



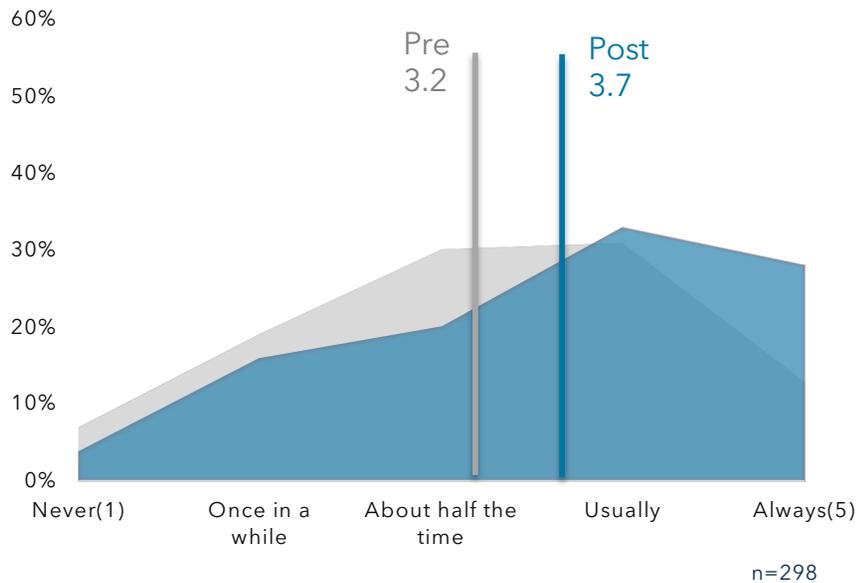
Key: ★ = This pattern is similar to 2018-2019.



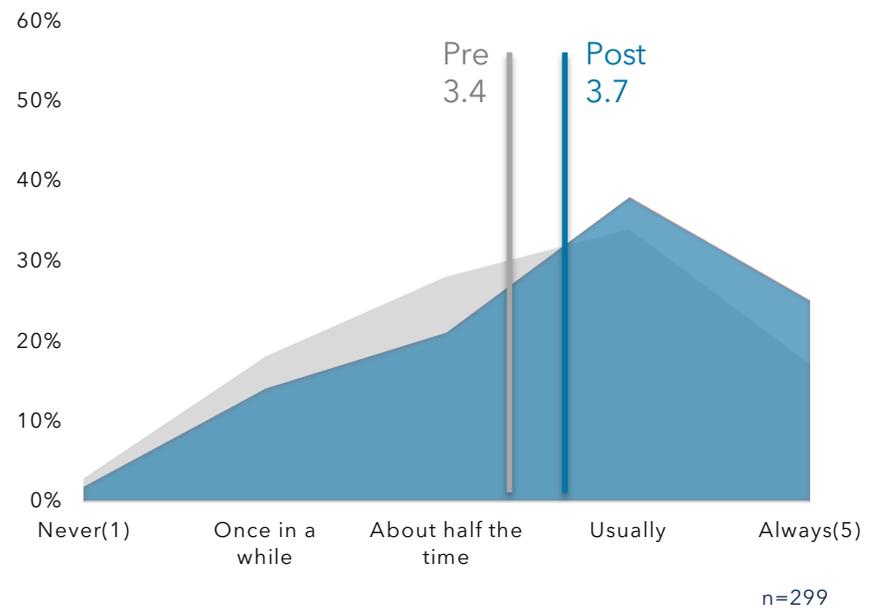
Individual Items (continued)

Teachers also reported significant increases in how frequently their students linked story events in sensible ways and how often their students were able to do things requiring mental effort.

When telling a story, real or fictional, links events in a way that makes sense (★)



Can do things that require mental effort (★)



Key: ★ = This pattern is similar to 2018-2019.

THE WIGGLE JIG'S IMPACT ON CHILDREN'S SOCIO-EMOTIONAL DEVELOPMENT



Did participating children increase their socio-emotional skills?



Measuring “Socio-Emotional Development”

At the beginning of each session and again at the end, teachers rated each child’s socio-emotional development, multi-step actions and cognitions, and other facets of executive function. This section of the report focuses on the survey items that measure socio-emotional development, as identified by factor analyses.

In a broad sense, socio-emotional development involves a child’s ability to understand and regulate her or his own emotions and to have positive relationships with others by being able to understand and respond to their emotions. Researchers consider the foundations of socio-emotional development to include sustained positive engagement with peers and regulating emotional experiences and expressiveness. This kind of emotional control involves managing, modulating, inhibiting, and enhancing emotion (Denham, 2006).



Measuring “Socio-Emotional Development” (continued)

Preschoolers’ socio-emotional development was measured by teachers’ responses to the following statements, focusing largely on their ability to understand others’ perspectives and respond to others’ emotions.

For each statement, teachers indicated whether the child displayed this ability or behavior... “Never | Once in a while | About half the time | Usually | Always”.

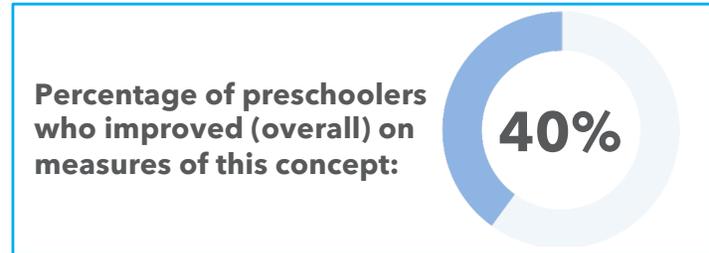
These Statements Reflect This Concept

- Cooperates in play or when completing a task.
- Shows affection and empathy toward you, familiar adults and children.
- Responds appropriately to others’ emotional responses.
- Describes emotions of others

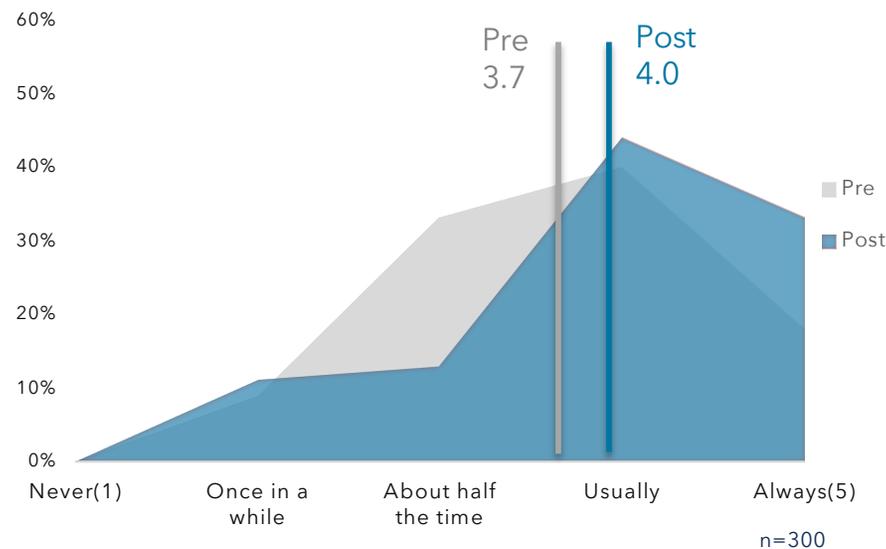


Children Increase Their Ability To Recognize, Describe, and Respond To Others' Emotions And Their Own After Participating In *The Wiggle Jig*

Over the course of the session, preschoolers taking part in *The Wiggle Jig* showed significant improvement in their socio-emotional abilities over time, as rated by teachers. Dance instruction emphasizes their ability to understand and respond to emotions.



Preschooler improvement on this overall concept from pre- to post- (▲)



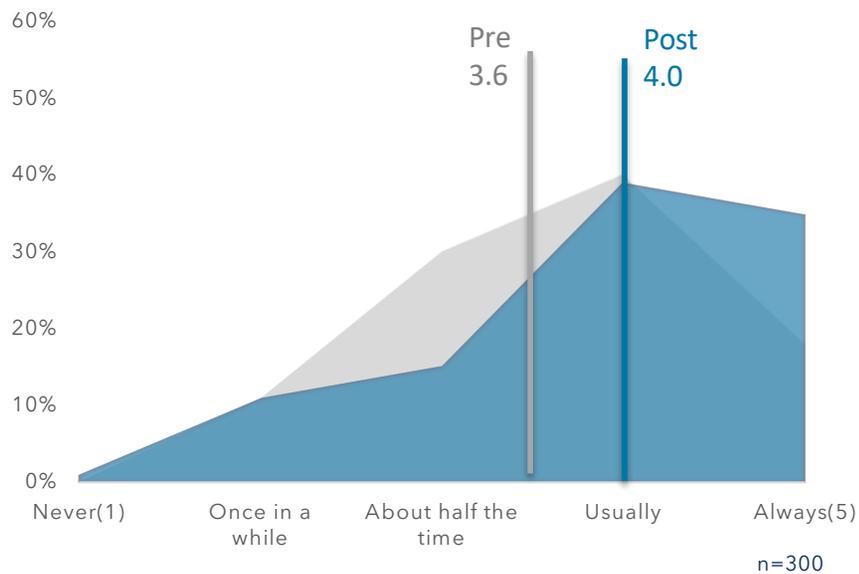
Key: ▲ = This pattern is more positive than 2018-2019.



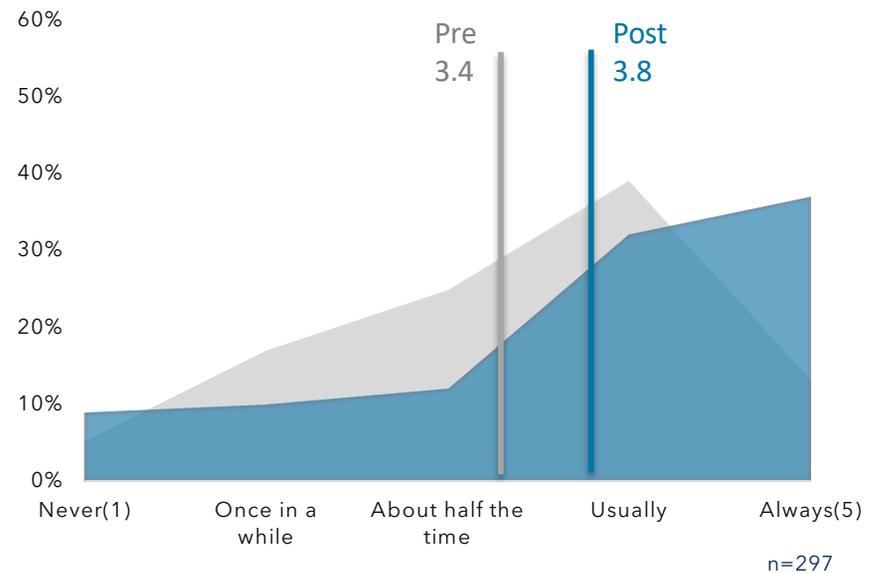
Individual Items

Teachers reported significant increases in how often children showed affection and empathy toward others and in how often they described the emotions of others.

Shows affection & empathy toward you, other familiar adults & children (▲)



Describes emotions of others (▲)

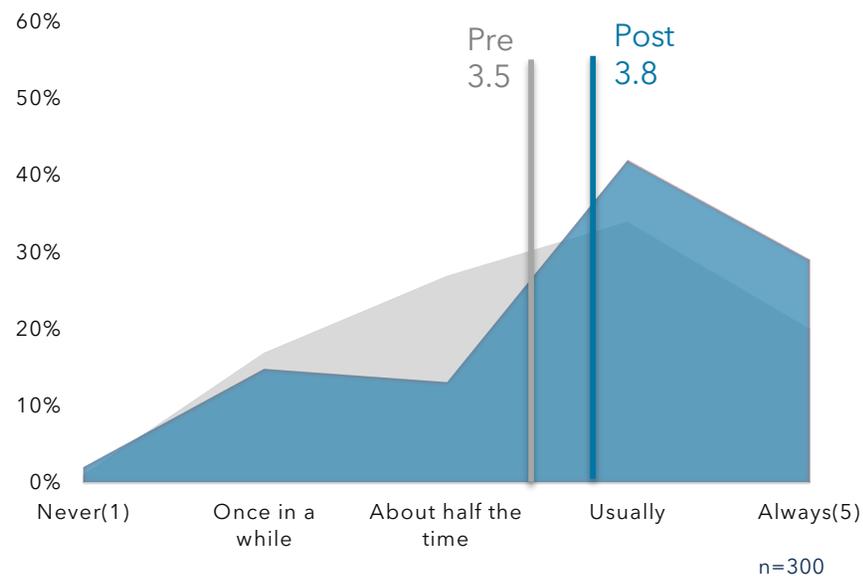




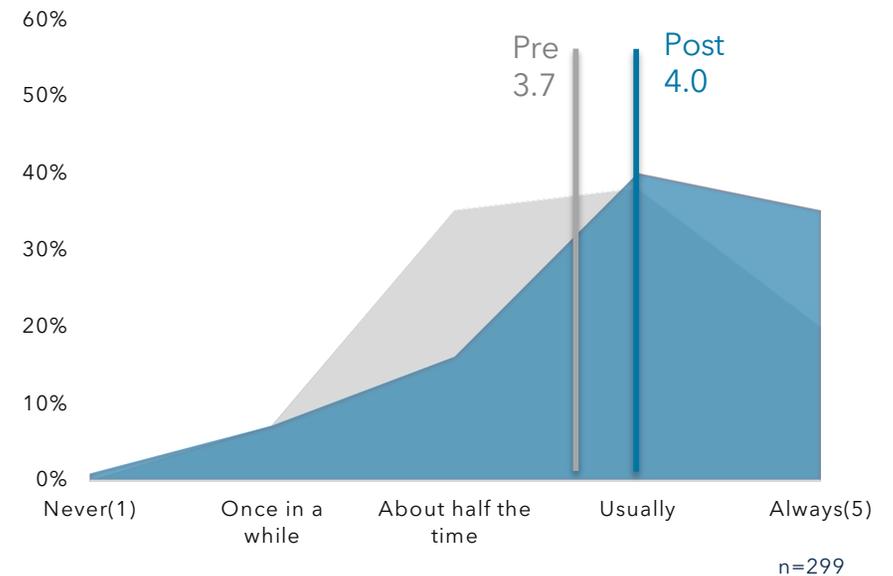
Individual Items (continued)

Teachers also reported significant increases in how often children responded appropriately to others' emotional responses, and in how often they cooperated in play or when completing a task.

Responds appropriately to others' emotional responses (★)



Cooperates in play or when completing a task (▲)



TEACHER FEEDBACK ON THE WIGGLE JIG



What did teachers think of the program after session completion?



Teachers Find Value In Incorporating Dance/Movement In Their Classroom

After completing *The Wiggle Jig*, the classroom teachers were asked a series of questions about their experience with the program. In all, 25 teachers completed this survey.

Value of dance/movement in the classroom

Over half (64%) of the teachers who completed post surveys reported dance/movement was “Extremely” valuable. Another 32% said it was “Very” valuable.

- 9 of the 15 teachers who completed both a pre and post survey, and who had not already said they were “Extremely” likely (i.e., those who *could* show an increase), showed an increase in valuation of dance/movement in the classroom.

There was improvement in the proportion of teachers who mentioned the developmental benefits of the program in their comments, compared to 2018-2019.

“ *Children learn to self-control physically and mentally. It impacts our children the capabilities in following the directions (multi-steps), attention span, remember and recall the sequences, and know about themselves and be aware of their bodies and appreciate the music expression.*

“ *Dance helped my children with gross motor skills in the classroom.*



Teachers are willing and confident when it comes to incorporating dance and movement into their classes, however some may need more guidance about how to do so.

Willing to incorporate dance/movement in the future

Over half (68%) of the teachers who completed post surveys chose the most positive rating, reporting they would be “Extremely” likely to use dance/movement in the future, with another 32% saying they were “Very” likely.

- 8 of 14 teachers who had the potential to show improved likelihood showed an increase from pre to post.

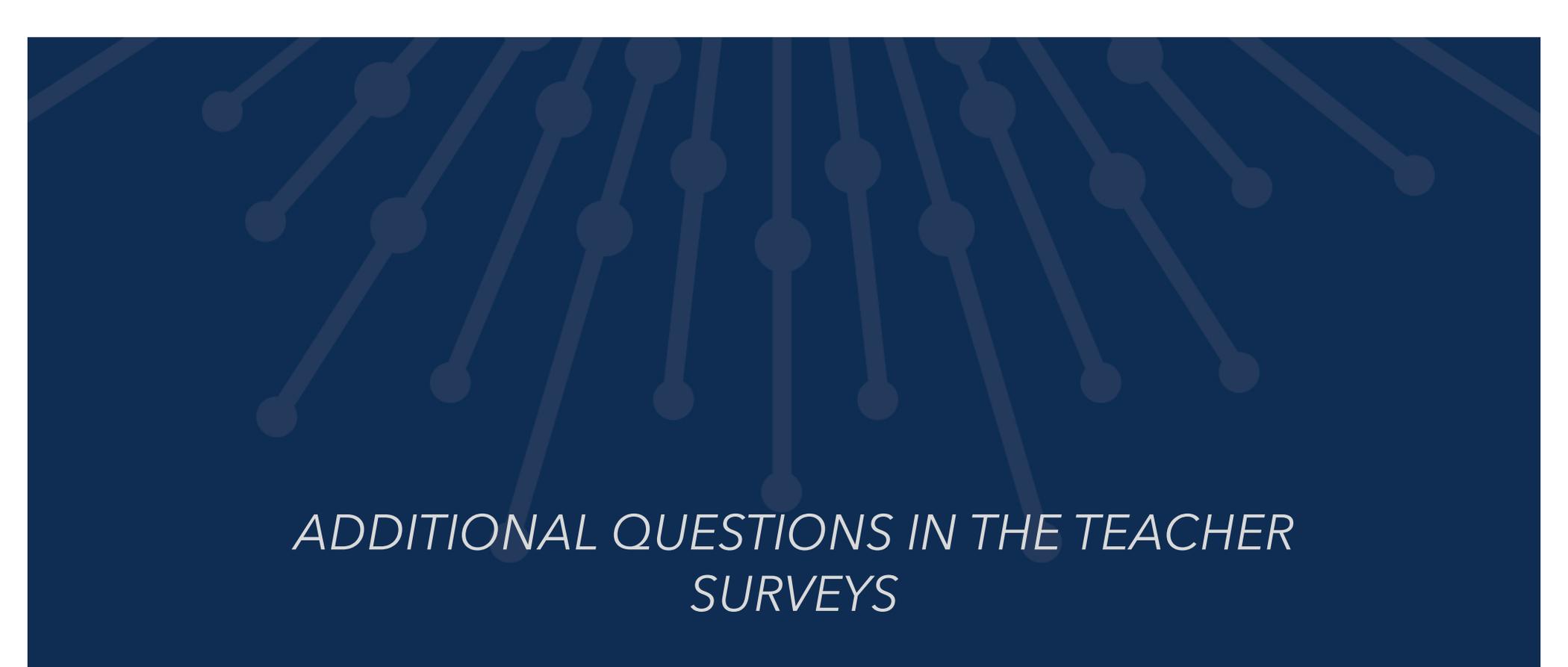
Confidence in ability to use dance/movement in the class

80% of the teachers reported being “Extremely” or “Very” confident using dance/movement in the classroom.

- 9 of 20 teachers who had the potential to show improved confidence showed an increase from pre to post.

When asked about the helpfulness of BalletMet Professional Development Workshops in preparing teachers to use movement in the classroom, many teachers left this field blank or indicated, “workshops were not offered,”* suggesting that teachers could use assistance finding these opportunities and possibly other resources to help them involve dance and movement in lesson plans.

*Note: One professional development program was offered at the beginning of the year for participating teachers to receive ODE/SUTQ credit. Only 10% attended due to limits of staffing or not knowing about it from their Center Director.



ADDITIONAL QUESTIONS IN THE TEACHER SURVEYS

Beyond the Socio-Emotional and Multi-Step Actions and Cognitions factors, what other changes were observed by teachers?



Other Questions In The Teacher Surveys

In addition to the previously discussed constructs of multi-step actions and cognitions and socio-emotional development, several other questions about students' behavior and development were also asked, but did not statistically cluster together into one or more intuitive conceptual categories, and so were not included in any distinct categories.

For each statement, teachers indicated whether the child displayed this ability or behavior... "Never | Once in a while | About half the time | Usually | Always".

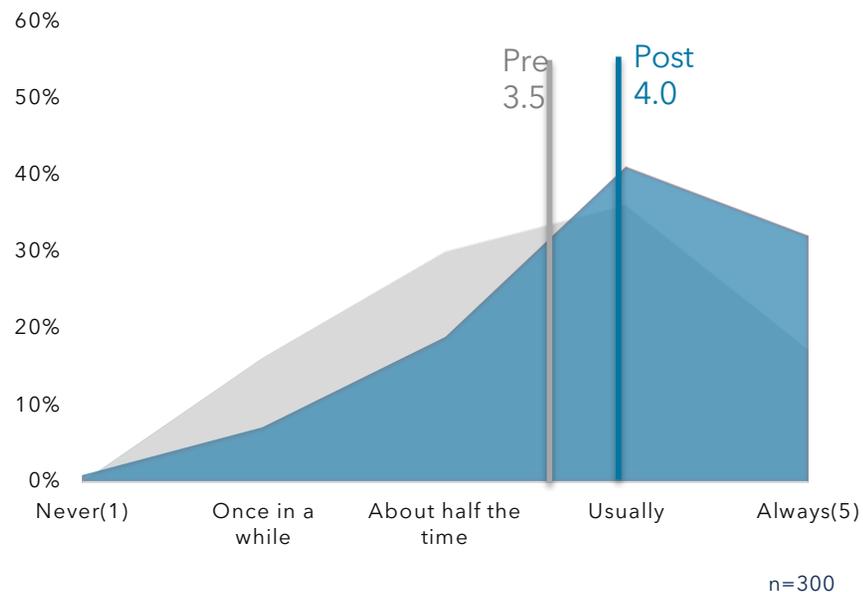
- Can shift gears and easily adapt behaviors to a new task.
- Adjusts behavior to different situations (e.g., eating at a restaurant versus eating at home).
- Waits his/her turn in games and other activities.
- Can calm self after periods of exciting activity.
- Does not talk at inappropriate times (e.g., at the library during story time).

ADDITIONAL QUESTIONS IN THE TEACHER SURVEYS



Teachers reported significant improvement in how often children were able to shift gears and adapt behaviors to new tasks, as well as how often they adjusted their behavior to different situations.

Can shift gears easily and adapt behaviors to a new task (★)



Adjusts behavior to different situations (★)

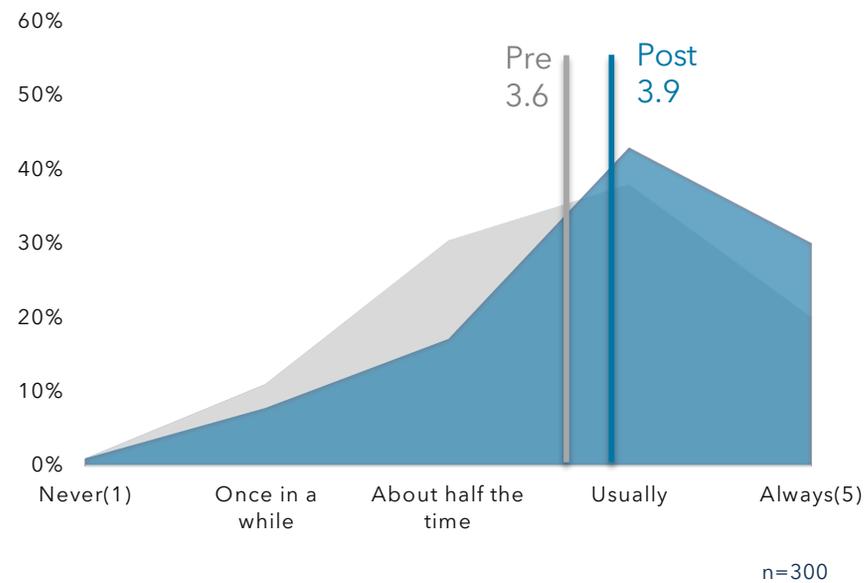


Key: ★ = This pattern is similar to 2018-2019.



Teachers also reported significant improvement in how often children waited their turns in games and other activities.

Waits his/her turn in games and other activities (★)



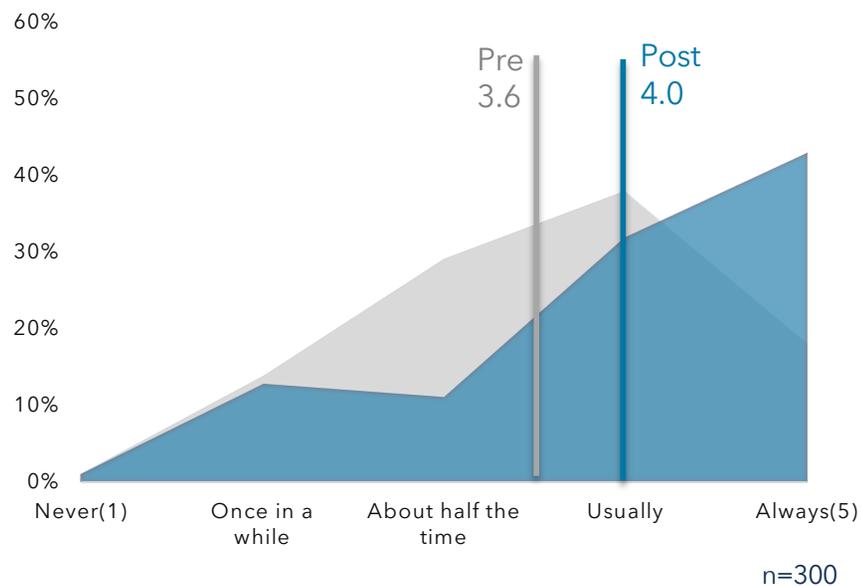
Key: ★ = This pattern is similar to 2018-2019.

ADDITIONAL QUESTIONS IN THE TEACHER SURVEYS

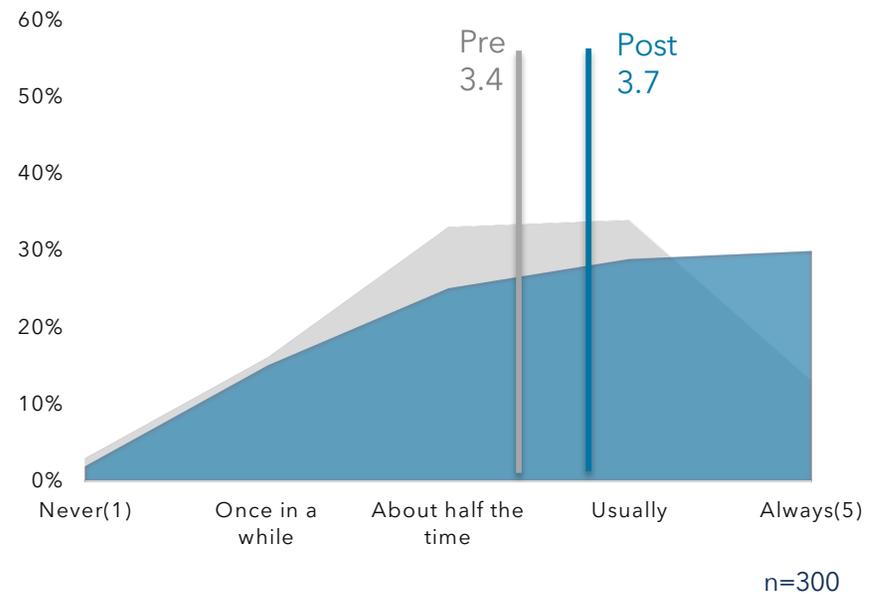


Teachers also reported significant improvements in how often children were able to calm themselves after excitement and how often they refrain from talking at inappropriate times

Can calm self after periods of exciting activity (▲)



Does not talk at inappropriate times (▲)



Key: ▲ = This pattern is more positive than 2018-2019.



IMPACT EVALUATION OF *THE WIGGLE JIG* PROGRAM (2019-2020): KEY TAKEAWAY



This robust evaluation of *The Wiggle Jig* program (2019-2020) finds considerable evidence to suggest this program has a significantly positive impact on preschoolers' motor control, multi-step actions and cognitions, and socio-emotional skills.

