Teacher Instructional Practices and School Readiness in ECE Classrooms in Ethiopia: Experience from Addis Ababa and Surrounding Schools

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ECE Pilot Partnership: AAU/OSU

Pilot Study supported through OSU

Aims of the original pilot study

- Characterize the educational, structural, and environmental context of ECE classrooms
- Develop 2 pilot interventions
- Knowledge exchange

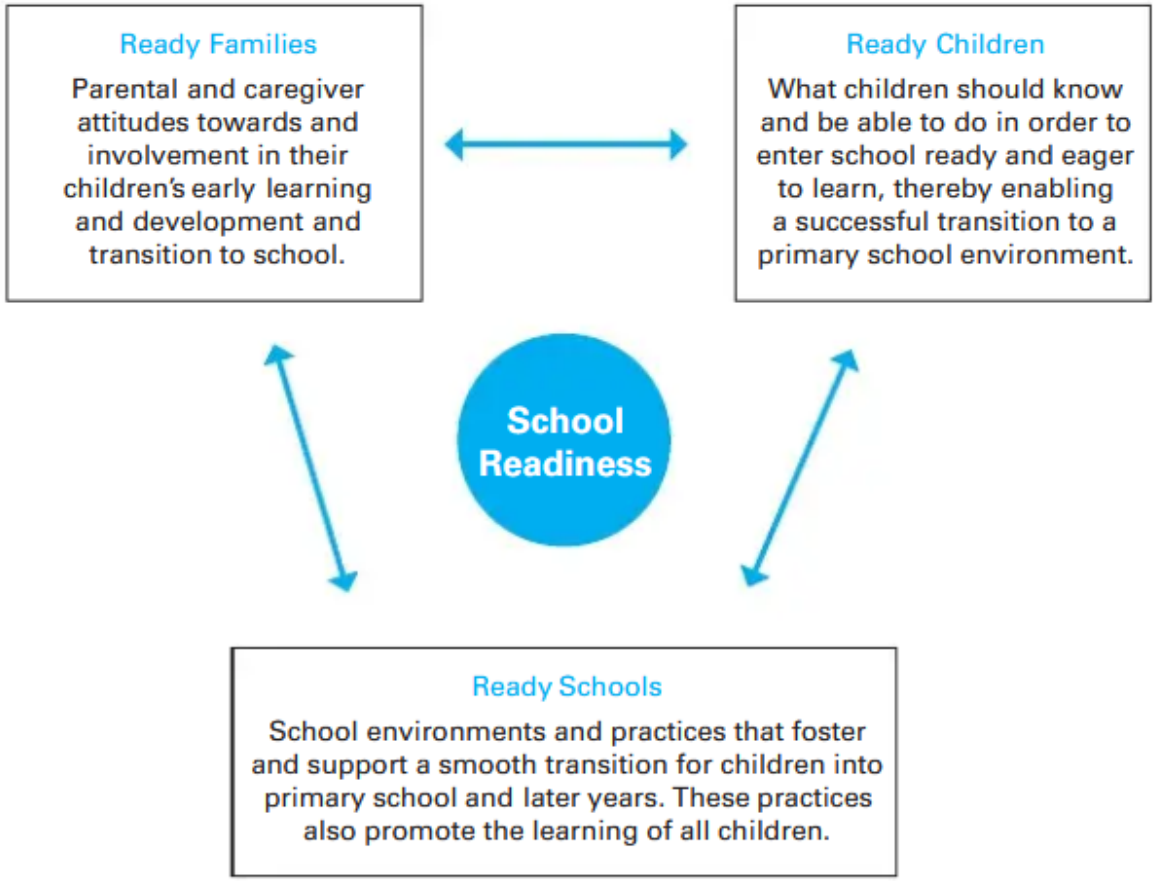
Research Capacity Building

Trained 10 Ph.D. students at AAU
TIPPS and IDELA
Teacher Survey and Principal Interviews
Research Ethics and Data Collection/Management

Motivation

- Research Training and Partnership
  - Collaboration between OSU/EHE (Ohio)and AAU/CELS (Ethiopia)
- ECE in Ethiopia
  - There has been progress and continuing government focus through recent ESDP (ESDP IV in 2010 and ESDP V in 2015)
  - Access improved through O-class and accelerated school readiness (ASR) programs
  - ECCE has become part of the General Education
  - However, Ethiopia still struggling to promote access and coverage of ECE, in addition to building ECE quality
  - Pilot study provides opportunity to examine how ECE teacher quality (actual practices and processes in the classroom) could be measured, and its relationship to children's school readiness

UNICEF – School Readiness

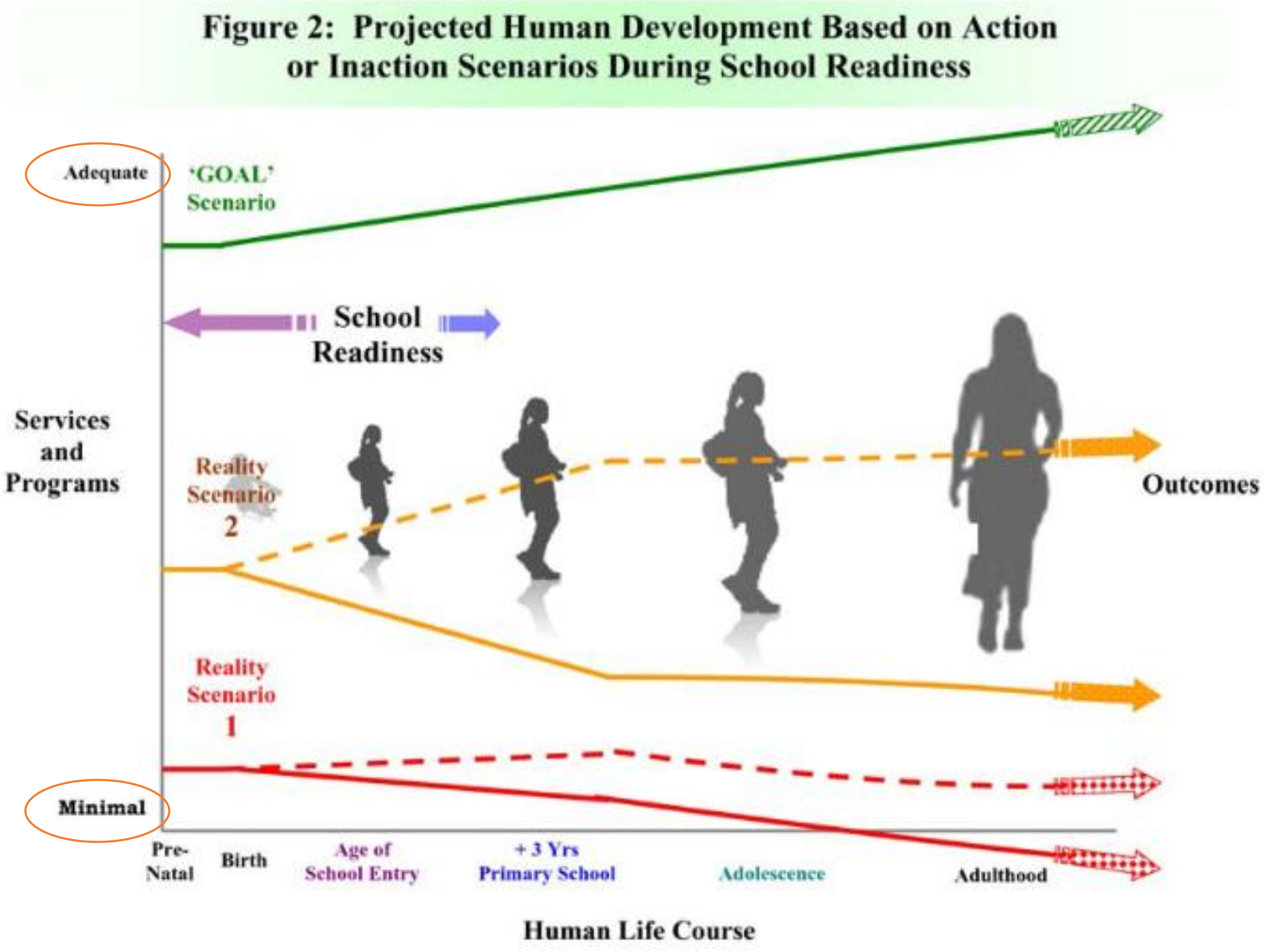


- Interactions between families, children and schools are affected by social, cultural, economic, political, and historical factors
- Are families able to work within this system?
- Are schools able to provide the necessary supports to teachers?
- Are students able to succeed?

https://www.scribd.com/document/409553401/UNICEF-School-Readiness-pdf

3 Scenarios that illustrate the Importance of School Readiness Impact across the life-span

- Closing the gap between “reality” and “goal” is critical to economic and human development
- Within Sub-Saharan Africa, ET is in lowest tier based on averages of global learning assessments (Angrist, et al (2021)



https://resources.leicestershire.gov.uk/sites/resource/files/field/pdf/2020/1/7/School-readiness-a-conceptual-framework-UNICEF.pdf

Current Study (results are preliminary)

1. Provide profile of classrooms, teachers, and the environmental context of ECE programs within and around Addis Ababa, Ethiopia
2. Examine whether and how features of EC classrooms, teachers and the school environment relate to student measures in terms of school readiness:
    - Emergent literacy
    - Emergent numeracy
    - Social-emotional development
    - Motor development
    - Executive function

Approach

Methods:

- Training (n = 10 PhD students, AAU) (AAU training videos)
- Head of School Interviews (n = 10)
- Teacher Surveys (n = 25) (Amharic translation)
- Classroom Observations (n = 25)
  - Teacher Instructional Practices and Processes System (TIPPS)
- Student Assessments (n = 60)
  - International Development of Early Learning Assessment (IDELA) – (w translations)

Training on TIPPS and IDELA, to criterion, held in September and Nov 2022

Sample:

- Convenience sample of pre-primary schools based on proximity to Addis Ababa and surroundings; existing relationships with AAU

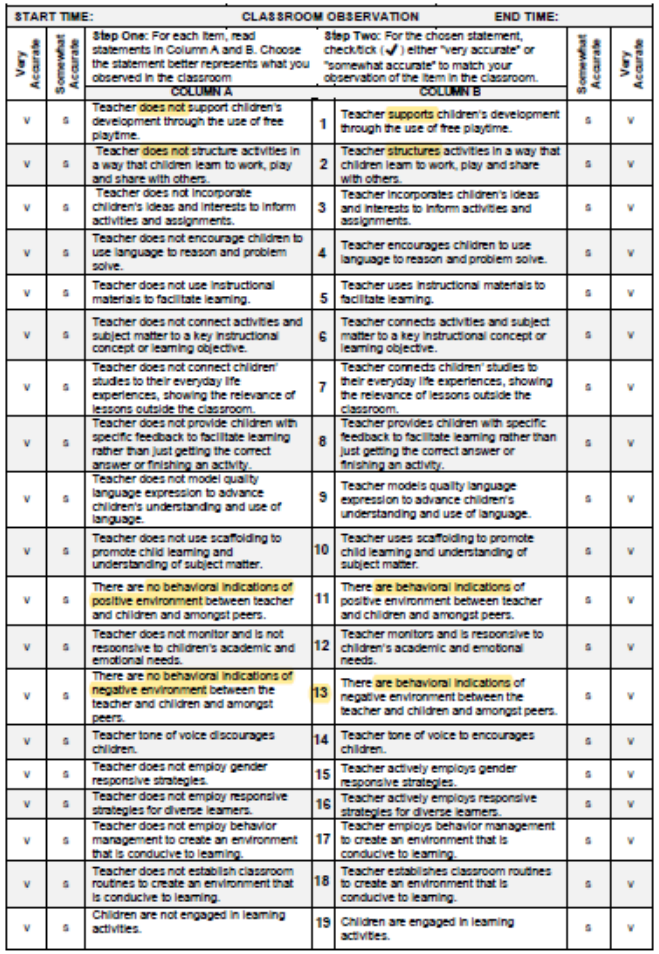
Ethics/IRB:

- Approved by CEBS; parent consent for assessments; teacher and principal consents; child assent for assessment (agreement)
- Incentives to teachers and school Head

In this paper, we focus on our preliminary results for the TIPPS and IDELA

Measures (1) – TIPPS Classroom Observations

Teacher Instructional Practices and Process System (TIPPS)



START TIME: CLASSROOM OBSERVATION END TIME:

Very Accurate	Somewhat Accurate	Step One: For each item, read statements in Column A and B. Choose the statement better represents what you observed in the classroom COLUMN A		Step Two: For the chosen statement, check/tick (✓) either "very accurate" or "somewhat accurate" to match your observation of the item in the classroom. COLUMN B	Somewhat Accurate	Very Accurate
v	s	Teacher does not support children's development through the use of free playtime.	1	Teacher supports children's development through the use of free playtime.	s	v
v	s	Teacher does not structure activities in a way that children learn to work, play and share with others.	2	Teacher structures activities in a way that children learn to work, play and share with others.	s	v
v	s	Teacher does not incorporate children's ideas and interests to inform activities and assignments.	3	Teacher incorporates children's ideas and interests to inform activities and assignments.	s	v
v	s	Teacher does not encourage children to use language to reason and problem solve.	4	Teacher encourages children to use language to reason and problem solve.	s	v
v	s	Teacher does not use instructional materials to facilitate learning.	5	Teacher uses instructional materials to facilitate learning.	s	v
v	s	Teacher does not connect activities and subject matter to a key instructional concept or learning objective.	6	Teacher connects activities and subject matter to a key instructional concept or learning objective.	s	v
v	s	Teacher does not connect children' studies to their everyday life experiences, showing the relevance of lessons outside the classroom.	7	Teacher connects children' studies to their everyday life experiences, showing the relevance of lessons outside the classroom.	s	v
v	s	Teacher does not provide children with specific feedback to facilitate learning rather than just getting the correct answer or finishing an activity.	8	Teacher provides children with specific feedback to facilitate learning rather than just getting the correct answer or finishing an activity.	s	v
v	s	Teacher does not model quality language expression to advance children's understanding and use of language.	9	Teacher models quality language expression to advance children's understanding and use of language.	s	v
v	s	Teacher does not use scaffolding to promote child learning and understanding of subject matter.	10	Teacher uses scaffolding to promote child learning and understanding of subject matter.	s	v
v	s	There are no behavioral indications of positive environment between teacher and children and amongst peers.	11	There are behavioral indications of positive environment between teacher and children and amongst peers.	s	v
v	s	Teacher does not monitor and is not resoonsive to children's academic and emotional needs.	12	Teacher monitors and is resoonsive to children's academic and emotional needs.	s	v
v	s	There are no behavioral indications of negative environment between the teacher and children and amongst peers.	13	There are behavioral indications of negative environment between the teacher and children and amongst peers.	s	v
v	s	Teacher tone of voice discourages children.	14	Teacher tone of voice to encourages children.	s	v
v	s	Teacher does not employ gender responsive strategies.	15	Teacher actively employs gender responsive strategies.	s	v
v	s	Teacher does not employ responsive strategies for diverse learners.	16	Teacher actively employs responsive strategies for diverse learners.	s	v
v	s	Teacher does not employ behavior management to create an environment that is conducive to learning.	17	Teacher employs behavior management to create an environment that is conducive to learning.	s	v
v	s	Teacher does not establish classroom routines to create an environment that is conducive to learning.	18	Teacher establishes classroom routines to create an environment that is conducive to learning.	s	v
v	s	Children are not engaged in learning activities.	19	Children are engaged in learning activities.	s	v

Early Grade Classrooms Back Page

- Real-time observations, 1 session/period (paper and pencil; two raters)
- Environmental items plus 19 items scored 0, 1, 2, 3.
  - Higher score is indicative of presence of positive behaviors from the teacher (item 13 is reversed)
- Examples:
  - "Teacher encourages children to use language to reason and problem solve."
  - "There are behavioral indications of positive environment between teacher and children and amongst peers."
- Factor analysis of our data was consistent with 3 factors, similar to Wolf, Raza et al., 2018 & Seidman et al., 2018
- *Facilitating Deeper Learning* (FDL); *Supporting Student Expression* (SSE); and *Emotional Support and Behavior Management* (ES/BM)

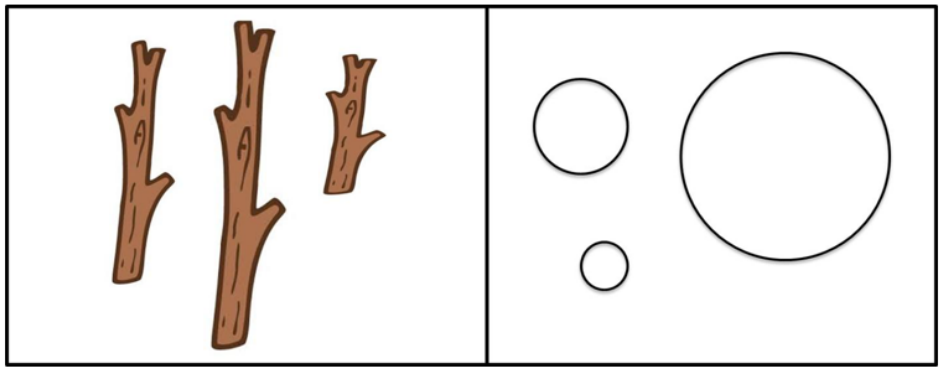
Measures (2) – IDELA School Readiness Assessment

International Development and Early Learning Assessment (IDELA)

- Global learning assessment, Save the Children (Pisani et al., 2018)
  - 22 core items, each with several components
- Measures overall early learning (age 3.5 – 6 yrs) across four main domains
  - Emergent literacy, emergent numeracy, motor development, socio-emotional development
  - Plus: self-regulation and children's approaches to learning

SCORING

a) Child identifies biggest circle	Correct	Incorrect	No response
b) Child identifies smallest circle	Correct	Incorrect	No response
c) Child identifies longest stick	Correct	Incorrect	No response
d) Child identifies shortest stick	Correct	Incorrect	No response



- Pairs of assessors, approx. 35 minutes each child, in child's language
- Play-based and active for the child
- Example item: early math skill
  - Can you identify biggest, smallest circle?
  - Can you identify longest, shortest stick?

Our Sample

Teachers: 1 male, 24 Female

	Urban	Rural	Total
Heads of School	5	5	10
Kindergarten Schools selected for Classroom Observation	5	5	10
Kindergarten Schools for Student Assessment	2	2	4
Classrooms Observed	15	10	25
Teachers for Survey (Teaching in KG1 - KG 3 and O-Class)	15	10	25
Students Assessed (KG1-KG3)	30	30	60

Background Characteristics of Children

		Sex of Child		
		Male	Female	
Zone	Kindergarten	Count	Count	Total Count
Urban	KG-1	5	5	10
	KG-2	4	6	10
	KG-3	6	4	10
	O-Class	0	0	0
Total		15	15	30
Rural	KG-1	5	3	8
	KG-2	2	6	8
	KG- 3	3	2	5
	O-Class	4	5	9
Total		14	16	30
Both Urban & Rural	KG-1	10	18	18
	KG-2	6	12	18
	KG-3	9	6	15
	O-Class	4	5	9
Total		29	31	60

- For IDELA Assessment:
- Fairly split between boys and girls
- 30 rural and 30 urban children
- 9 O-Class children (rural only)

Background Characteristics of Classrooms (n = 25)

- **Class Sections observed** (Grade Level)
  - 0 Class (n = 2)
  - KG1 (n = 11)
  - KG2 (n = 6)
  - KG3 (n = 6)
- **Urban** (n = 15) Rural (n = 10)
- **Subjects observed**
  - Amharic (n = 8)
  - Math (n = 6)
  - English (n = 4)
  - Local language (n = 2)
  - Others (n = 1 each): Song, Science, Storytelling, English & Math (1 missing)
- **Teachers observed**: Male (n = 1) Female (n = 24)
- **Teachers in the classroom**:
  - One (n = 7)
  - Two (n = 13)
  - Three or more (n = 4)
  - Missing (n = 1)
- **Students in classroom** (Mean = 55.8, SD = 24.2)
  - < 25 (n = 0)
  - 26 to 50 (n = 13)
  - 51 to 75 (n = 8)
  - 76 to 100 (n = 1)
  - > 100 (n = 2)
  - Missing (n = 1)
- **Proportion Girls in classroom**
  - Mean = 49.0%, SD = 9.7%
  - Min = 21.15%
  - Max = 70.27%

Features of Classrooms (n = 25)

TIPPS Environment

Features of Classrooms	Yes	No	Missing
Wearing Uniform	11	14	
Writing Materials	23	2	
Books	10	15	
Adequate Seating Space	16	9	
Adequate Writing Space	18	7	
Outside Noise	1	23	1
Blackboard	1	24	
Charts, Posters Displayed	21	2	2
Chair, Table for Teacher	23	2	
Adequate Lighting	24	1	
Children participate in classroom management	2	17	6

Orange = weaker areas, Blue = stronger

Results – TIPPS: Facilitating Deeper Learning (FDL; n = 25 classrooms)

Subscale 1. Facilitating Deeper Learning	Item Mean	Item SD
TIPPS_1: Teacher supports children's development through the use of free playtime	.16	.554
TIPPS_2: Teacher structures learning activities to aid children to learn to work, play, and share with others	.28	.678
TIPPS_5: Teacher uses instructional materials that facilitate learning.	2.28	1.100
TIPPS_8: Teacher provides children with specific feedback to facilitate learning rather than just getting the correct answer or finishing an activity.	.88	1.013
TIPPS_10: Teacher uses scaffolding to promote children's learning and understanding of subject matter.	1.48	1.194
Scale Mean for FDL	**1.01**	**.63**
Subscale 1: Reliability	*alpha* = .696	

Orange = weaker areas, Blue = stronger

Results – TIPPS: Supporting Student's Expression (SSE; n = 25 classrooms)

Subscale 2. Supporting Student's Expression	Mean	SD
TIPPS_3: Teacher uses children's ideas and interests to inform activities and assignment.	.08	.28
TIPPS_4: Teacher encourages children to use language to reason and problem solve.	.24	.52
TIPPS_6: Teacher connects activities and subject matter to a key instructional concept or learning objectives.	1.56	1.08
TIPPS_7: Teacher connects children's studies to their everyday life experiences, showing the relevance of lessons outside the classroom.	.58	.83
TIPPS_9: Teacher models quality language expressions to advance children's understanding and use of language.	.08	.28
Scale Mean for SSE	**.53**	**.42**
Subscale 2: Reliability	*alpha* = .602	

Orange = weaker areas, Blue = stronger

Results – TIPPS: Emotional Support and Behavioral Management (ES/BM; n = 25 classrooms)

Subscale 3. Emotional Support and Behavioral Management	Mean	SD
TIPPS_11: Behavioral indications of positive environment between the teacher and children and amongst peers.	2.68	.63
TIPPS_12: Teacher monitors and is responsive to children's academic and emotional needs.	2.04	.94
TIPPS_13: Behavioral indications of negative environment between the teacher and children and amongst peers.	.52	1.01
TIPPS_14: Teacher tone of voice influence children.	2.80	.41
TIPPS_15: Teacher actively employs gender responsive.	2.88	.33
TIPPS_16: Teacher actively employs responsive strategies for diverse learners.	2.60	.50
TIPPS_17: Teacher employs behavior management to create an environment that is conducive to learning.	2.48	.82
TIPPS_18: Teacher establishes classroom routines to create an environment that is conducive to learning.	2.72	.68
TIPPS_19: Children are engaged in learning activities.	2.84	.47
Scale Mean for ES/BM	**2.40**	**.39**
Subscale 3: Reliability	*alpha* = .738	

TIPPS Urban/Rural Differences (n = 25)

Overall TIPPS

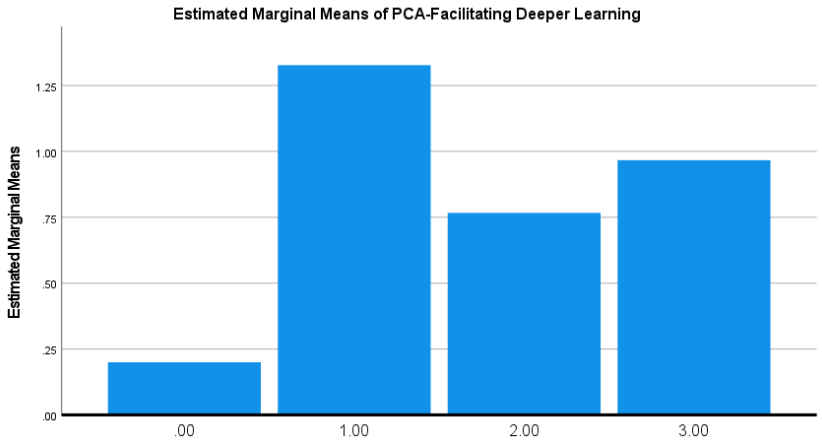
		FDL	SSE	ES_BM
N	Valid	25	24	25
	Missing	0	1	0
Mean		1.0160	.5250	2.3956
Std. Deviation		.63224	.41625	.38634
Minimum		.00	.00	1.11
Maximum		2.40	1.40	3.00

Group Statistics

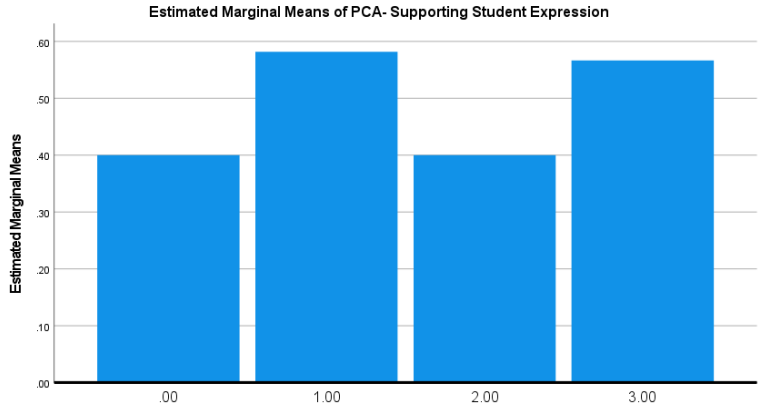
	urban	N	Mean	Std. Deviation	Std. Error Mean
FDL	.00 rural	10	.7800	.56135	.17751
	1.00 urban	15	1.1733	.64528	.16661
SSE	.00 rural	10	.2600	.25033	.07916
	1.00 urban	14	.7143	.41298	.11037
ES_BM	.00 rural	10	2.2111	.52234	.16518
	1.00 urban	15	2.5185	.19994	.05162

- TIPPS item scale is 0, 1, 2, 3
- Urban schools higher on all TIPPS subscales
- Only for SSE is this difference statistically significant (p = .005)
  - Urban > Rural
  - The standard deviation for Rural is very constrained

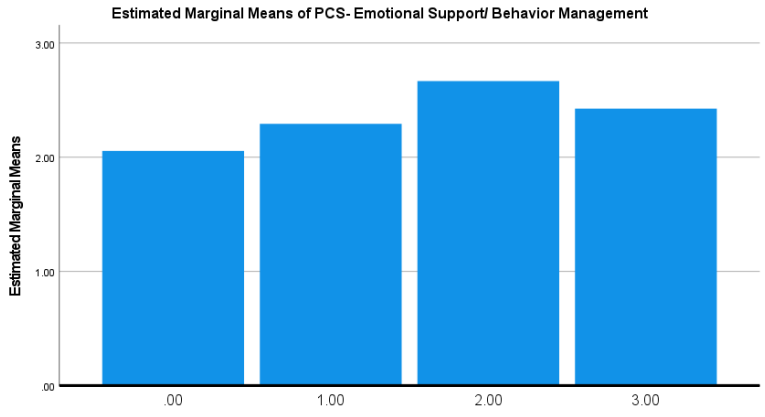
TIPPS Grade Level Differences (n = 25)



FDL



SSE



ES/BM

- O-level classrooms often lowest on TIPPS subscales
- Statistical difference for the FDL scale (p = .018) for O-level versus KG1.
- No significant differences across 0-level to KG3 on the SSE or the ES/BM subscales

Results – TIPPS Correlations and Summary

	1	2	3
1.FDL	1.00		
2. SSE	.315	1.00	
3. ES_BM	.098	.187	1.00

no statistically sig. correlation

Subscale	Mean	SD
FDL	1.01	.63
SSE	.53	.42
ES/BM	2.40	.39

- TIPPS dimensions are relatively independent in this sample
- FDL: Teachers used instructional materials well but challenges in other supports for learning, particularly for O-level
- SSE: Teachers tended to connect activities to subject matter, but struggled incorporating and encouraging children's own ideas/interests
  - Lower SSE for Rural versus Urban teachers
- ES/BM: ET teachers are warm, provide emotional support, good classroom routines and behavior management

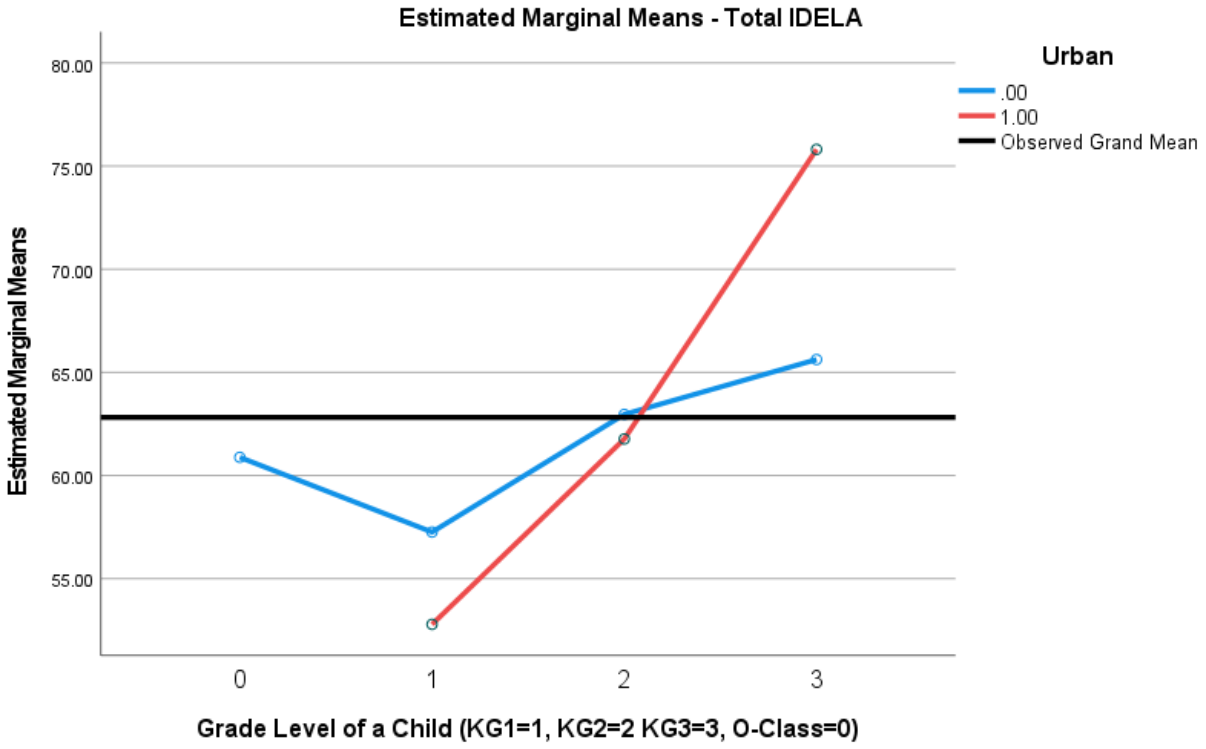
Results – IDELA Subscales

- 22 core items, each with multiple components
- Scoring followed IDELA guidelines

Subscale	Numeracy	Literacy	Socio-Emo	Motor	Total
n	60	56	60	60	60
n(items)	7	6	5	4	22
Mean	52.37	61.26	66.78	65.56	62.82
SD	17.03	20.33	19.21	18.93	14.43
alpha	.67	.70	.55	.71	.84

Differences in TOTAL IDELA across Grade Levels and Urban/Rural

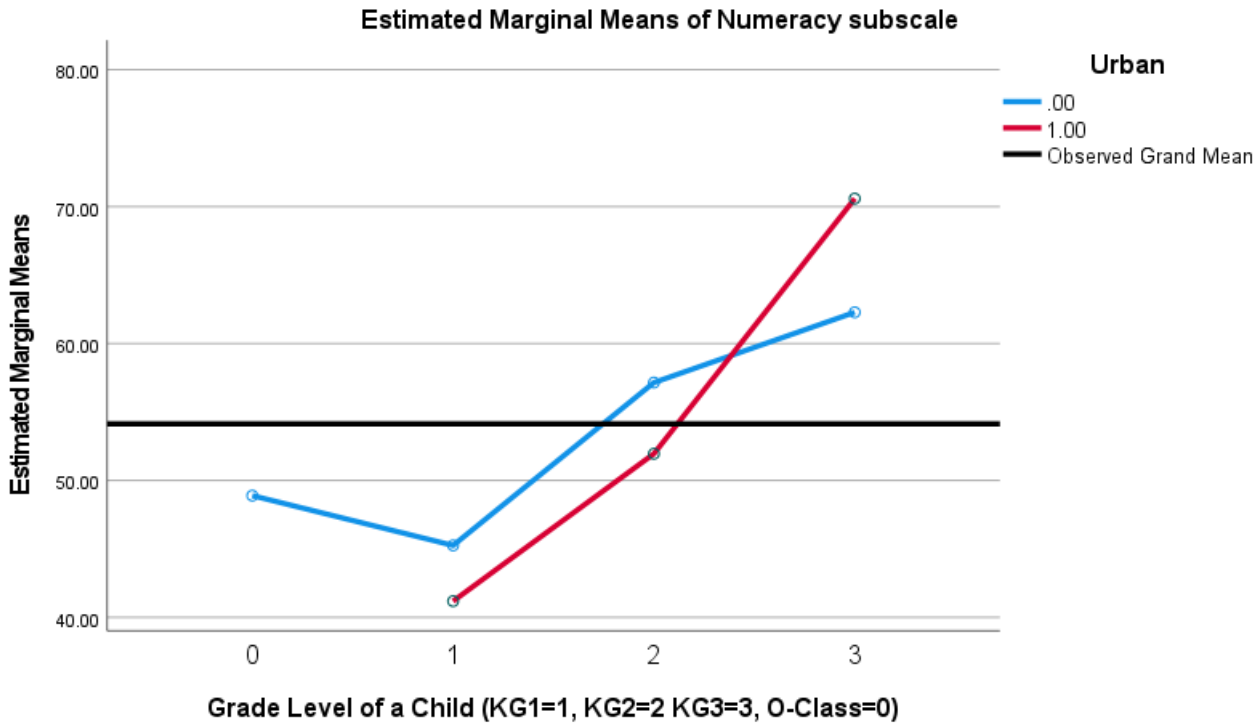
- Because O-level only is present in Rural schools, we conducted a series of ANOVAs



Two-Way Results – Total IDELA

With O-Class	Sig (p-value)	Partial η^2
GradeLevel	.029 *	.167
Urban	.704	.003
Urban * GradeLevel	.318	.046
Overall R^2	24.4%	
Without O-Class		
GradeLevel	.017 *	.177
Urban	.716	.003
Urban * GradeLevel	.349	.049
Overall R^2	25.5%	

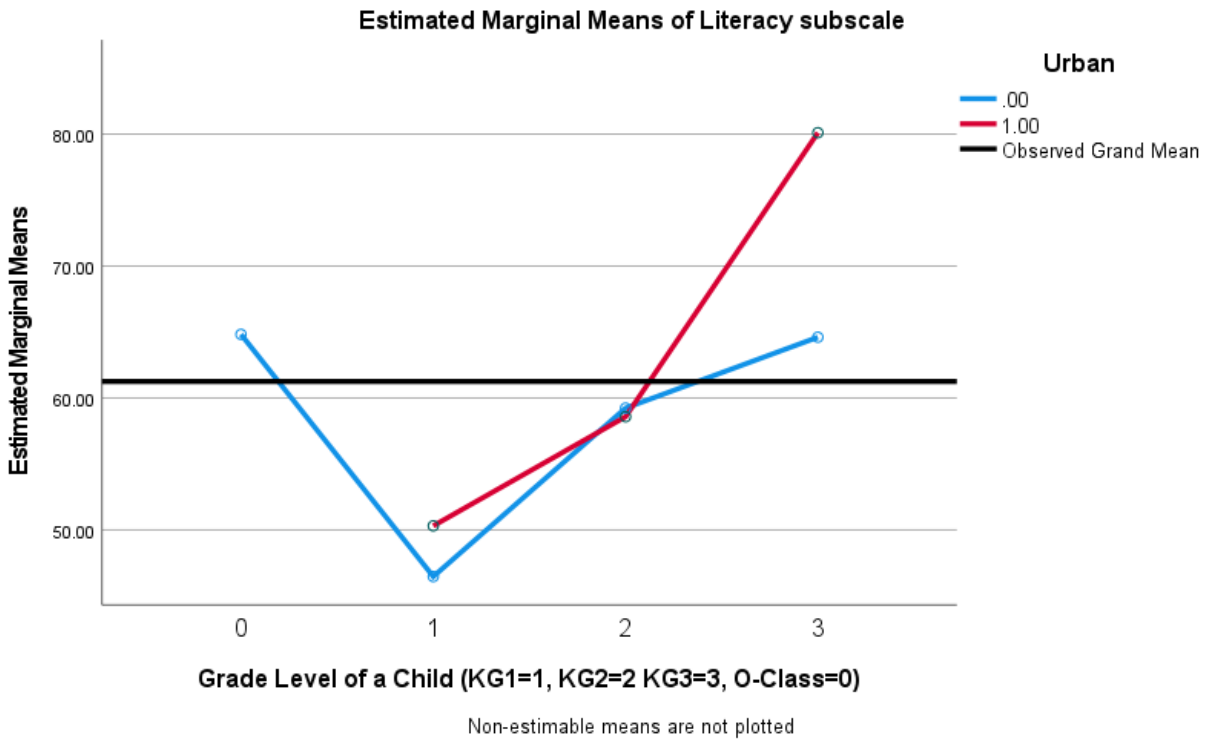
Emerging Numeracy differences, GradeLevel and Urban/Rural



Two-Way Results – Numeracy

With O-Class	Sig (p-value)	Partial η^2
GradeLevel	< .001 *	.310
Urban	.936	.000
Urban * GradeLevel	.331	.044
Overall R^2	37.7%	
Without O-Class		
GradeLevel	< .001 *	.336
Urban	.936	.000
Urban * GradeLevel	.335	.051
Overall R^2	40.0%	

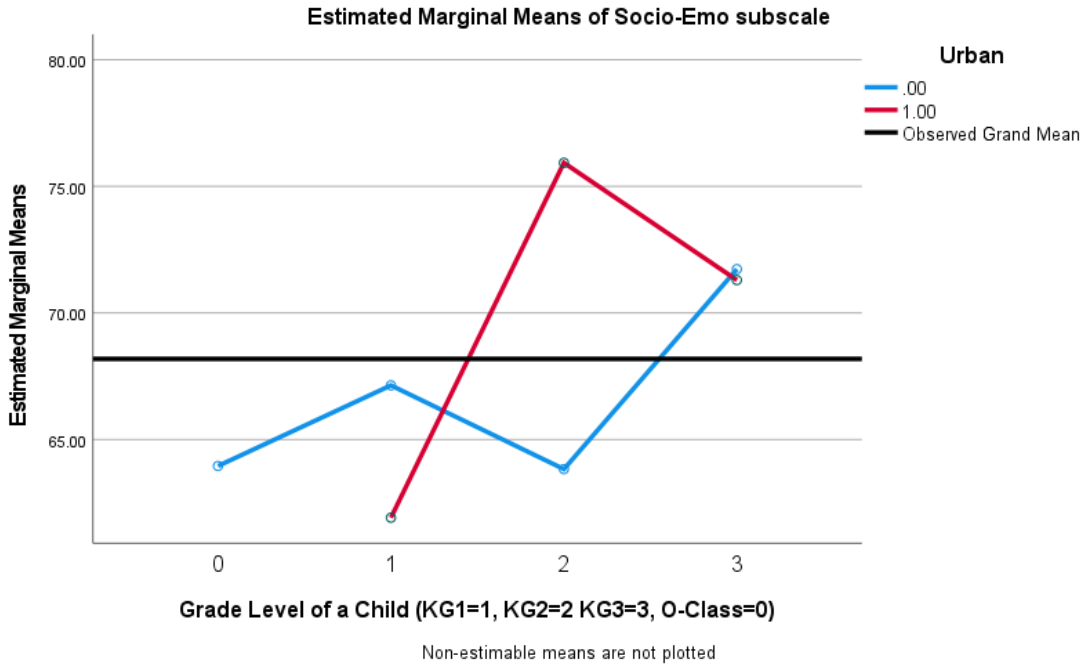
Emerging Literacy differences, GradeLevel and Urban/Rural



Two-Way Results – Literacy

With O-Class	Sig (p-value)	Partial η^2
GradeLevel	.007 *	.218
Urban	.257	.026
Urban * GradeLevel	.472	.030
Overall R^2	27.7%	
Without O-Class		
GradeLevel	.006 *	.215
Urban	.271	.029
Urban * GradeLevel	.491	.033
Overall R^2	29.4%	

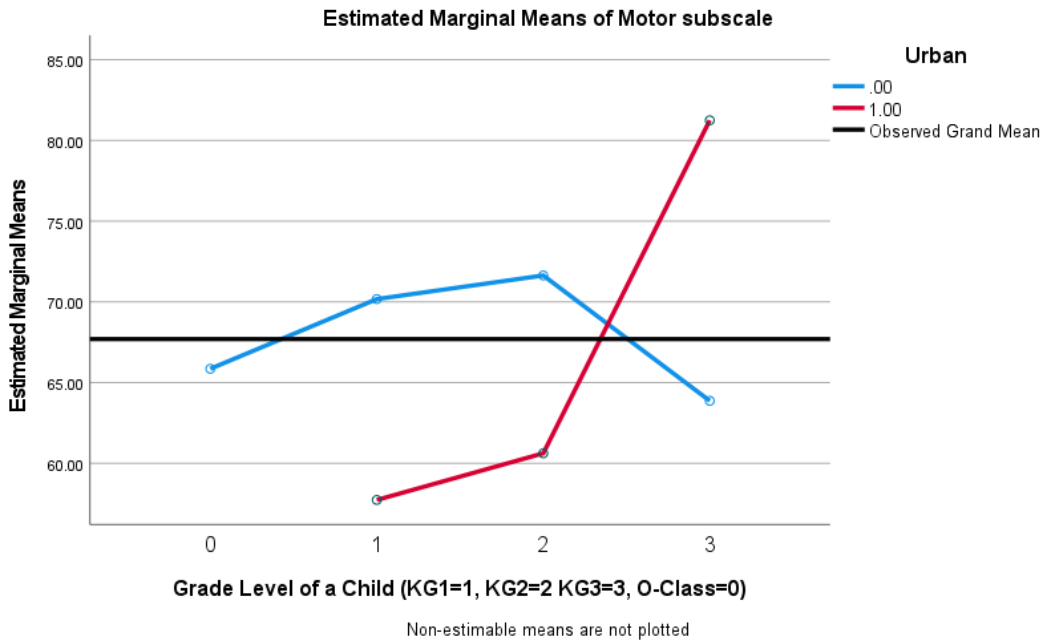
Socio-Emotional differences, GradeLevel and Urban/Rural



Two-Way Results – Socio-emotional

With O-Class	Sig (p-value)	Partial η^2
GradeLevel	.748	.024
Urban	.709	.003
Urban * GradeLevel	.417	.035
Overall R^2	7.1%	
Without O-Class		
GradeLevel	.592	.025
Urban	.708	.003
Urban * GradeLevel	.416	.041
Overall R^2	7.3%	

Motor Skills differences, GradeLevel and Urban/Rural



Two-Way Results – Motor

With O-Class	Sig (p-value)	Partial η^2
GradeLevel	.463	.051
Urban	.649	.004
Urban * GradeLevel	.016 *	.155
Overall R^2	23.7%	
Without O-Class		
GradeLevel	.333	.051
Urban	.667	.004
Urban * GradeLevel	.025 *	.161
Overall R^2	24.4%	

How does teacher quality (TIPPS) relate to IDELA subscales?

- Outcomes = Total IDELA and 4 subscales (n = 60)
  - Early numeracy, literacy, socio-emotional and motor skills
- 2 rural and 2 urban schools were selected for the IDELA assessments
  - We aggregated the TIPPS subscales from each of these 4 schools as the predictors for “school-level” teacher quality
- Predictors = FDL, SSE, ES/BM (centered at their mean)
  - Facilitating deeper learning
  - Supporting student expression
  - Emotional support/Behavior Management
- Other predictors = Urban (versus rural) and GradeLevel (O, 1, 2, 3)
  - GradeLevel not linear, so treated as categorical in Regressions

Correlations – IDELA and TIPPS

	Total IDELA	Numeracy	Literacy	Socio-Emo	Motor	FDL	SSE	ES/BM
Total IDELA	1	.828*	.857*	.725*	.833*	.118	-.039	-.087
Numeracy		1	.652*	.521*	.647*	.169	-.055	.006
Literacy			1	.411*	.682*	.255	-.023	.017
Socio-Emo				1	.475*	.031	.017	-.045
Motor					1	.156	-.265*	-.191
FDL						1	-.100	.591*
SSE							1	.505*
ES/BM								1

Note: not adjusted for classroom clustering of TIPPS

Predicting Total IDELA: $R^2 = 32.4\%$

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	60.911	4.781		12.740	<.001
	d1_gradelevel	-6.688	5.854	-.207	-1.142	.259
	d2_gradelevel	1.634	5.733	.053	.285	.777
	d3_gradelevel	13.253	6.112	.410	2.168	.035
	C_FDL	12.473	5.257	.422	2.372	.022
	C_SSE	8.966	11.835	.133	.758	.452
	C_ESBM	-137.974	55.505	-.510	-2.486	.016

a. Dependent Variable: TotalIDELA

- Prediction for O-level is 60.911, when all TIPPS are at their average for the sample
- Decreases for KG1, increases for KG2 and KG3
- Increases by (12.473 * .57) = 7.11 points as FDL increases by 1 SD (one SD is .57)
- Decreases by (-137.974 * .07) = -9.66 points as ES/BM increases by 1 SD (one SD is .07)

- Controlling for all other predictors:
- There are significant differences in TotalIDELA between KG3 and O-level
- TIPPS FDL is positively and significantly related to TotalIDELA
- ES/BM is negatively but significantly related to TotalIDELA

Predicting IDELA Subscales from TIPPS

Controlling for all other predictors in the model:

- Numeracy: $R^2 = 45.8\%$
  - Only difference is between KG3 and O-level (KG3 higher), $p < .001$
- Literacy: $R^2 = 40.1\%$
  - Difference between KG1 and O-level (O-level higher), $p = .014$
  - FDL significant and positive, $p < .001$
  - ES/BM significant and negative, $p = .008$
- Socio-Emotional: $R^2 = 8.0\%$
  - No significant differences
- Motor: $R^2 = 33.3\%$
  - Difference between KG3 and O-level (KG3 higher), $p = .043$
  - FDL significant and positive, $p = .023$
  - ES/BM significant and negative, $p = .017$

Summary (1)

- Small-scale pilot with preliminary results
- First: The TIPPS is a rich tool for assessing classroom processes and teacher practices
  - Can indicate areas of attention for teacher professional development
  - According to Kim et al. (2019), teachers need to know that learners observe the modeling of skills by their teachers
    - If teachers do not know appropriate teaching practice, they won't know how to model them!
  - Despite small sample, we observed significant urban/rural differences on the SSE scale for the TIPPS
  - We also saw significant O-level differences with much lower scores than KG1 to KG3 on FDL scale

Summary (2)

- Second: The TIPPS is predictive of components of school readiness, as measured through the IDELA
  - There were some differences in patterns based on subscale of the IDELA, but there is preliminary support for how teacher quality relates to children's early learning skills
- Third: Our collaboration/research capacity pilot – including training, data collection, data analysis, and current dissemination of results – was successful, with skills-strengthening for PhD candidates, and potential for carry over to larger-scale funding for ECE or related research studies
  - Collaboration and knowledge exchange is an important achievement that can be expanded

Thank you and we welcome your feedback!

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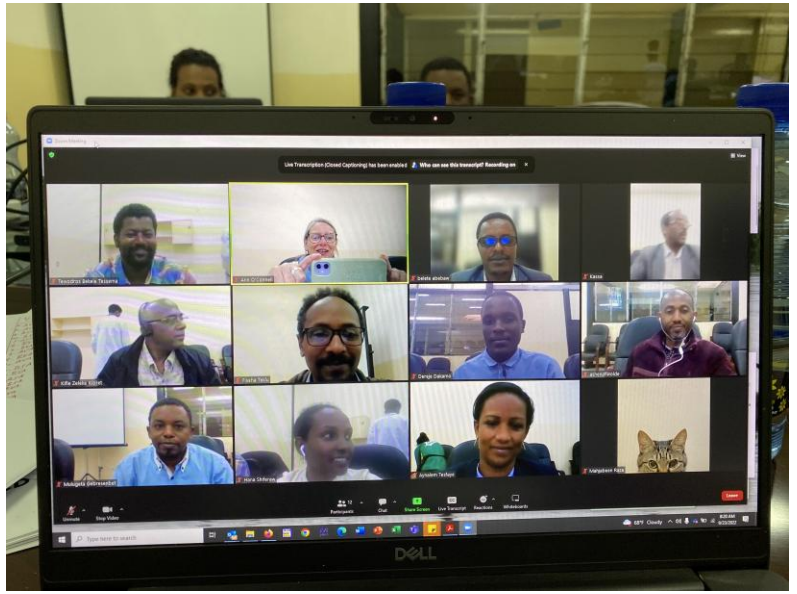

Link to references
https://docs.google.com/document/d/1uqo74tlBAnb4t4txS6zrTHcC0ILGHSGd/edit?usp=drive_link&ouid=110429357553677911851&rtpof=true&sd=true