

Impact of Pre-Kindergarten Programs on Student Performance in Early Schooling in the State of Mississippi

Collaboration Works!

July 26th, 2018

2018 NCES STATS-DC Data Conference
“Visualizing the Future of Education through Data”



Ensuring a bright future for every child



MISSISSIPPI STATE UNIVERSITY™
NATIONAL STRATEGIC PLANNING
& ANALYSIS RESEARCH CENTER

John Kraman

Chief Information Officer
Mississippi Department of Education
Jkraman@mdek12.org

Domenico “Mimmo” Parisi, Ph.D.

Executive Director
National Strategic Planning and Analysis
Research Center
Mississippi State University
mparisi@nsparc.msstate.edu

Yan Li, Ph.D.

Director, Office of Research and
Development
Mississippi Department of Education
YLi@mdek12.org

Outlines

Impact of Pre-Kindergarten Programs on Student Performance in Early Schooling in the State of Mississippi

Outlines

- Introduction
- Early Learning Collaboratives
- Research Study
- Concluding Remarks and Questions

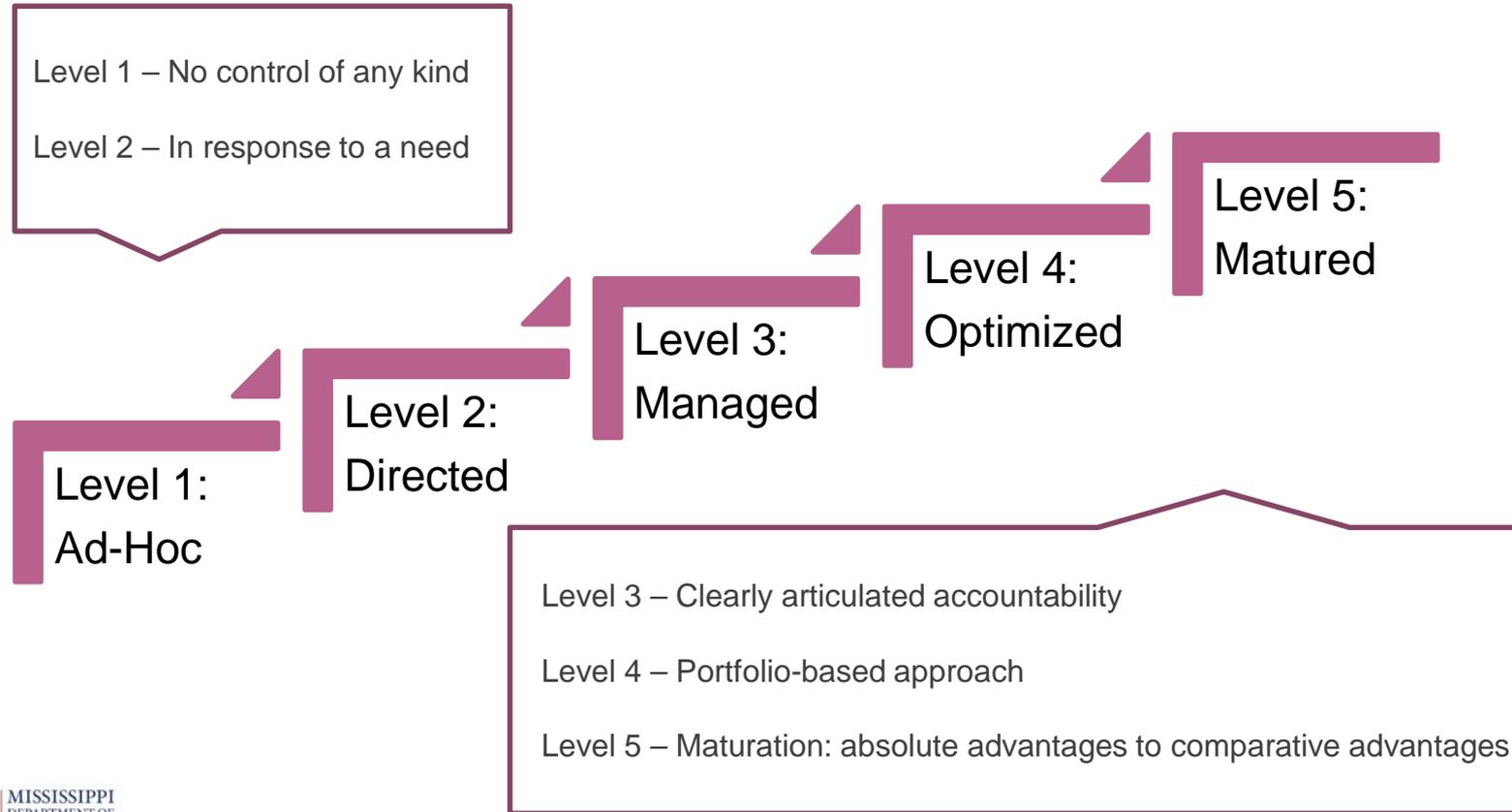
Introduction

Research Goals and Research
Capacity Maturity Model

Goals

- Disseminate knowledge and Insights
- Identify and leverage talents for maximum effectiveness and efficiency
- Achieve better integration with better data
- Leverage the statewide longitudinal data system for each data contributor to achieve its goals

Research Capacity Maturity Model



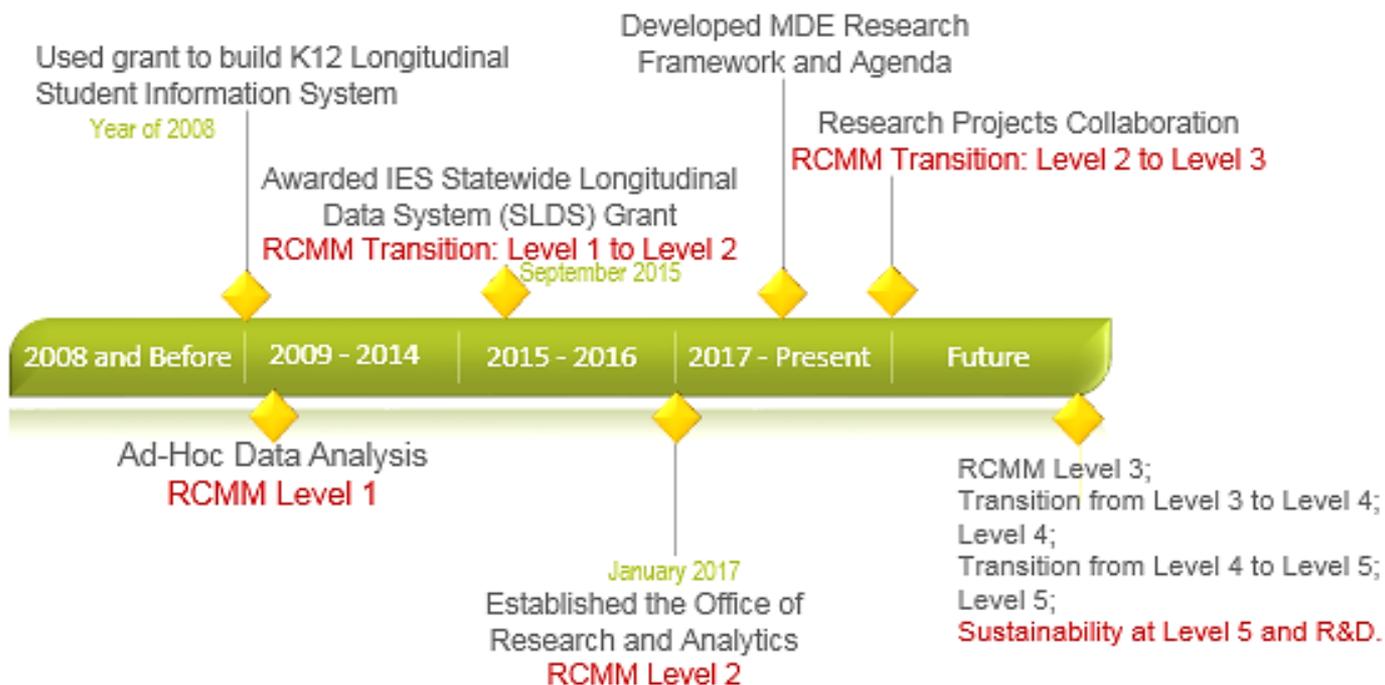
Grants Prior to 2015

- 2009 Grant - Mississippi's PK16 Longitudinal Data Initiative:
Expanded existing K-12 statewide data systems, and integrate the systems and related data of Mississippi's Workforce Performance Management System.
- 2009 ARRA Grant - Mississippi Integrated Education and Workforce Longitudinal Data System:
Created a relational database linking all education (K-20) and workforce data through a unique common identifier, and Include all the necessary data to link PK with K-20

2015 Mississippi SLDS Grant

- Grant Period
 - September 2015 – September 2019
- Grant Priorities
 1. Research and Evaluation
 2. Early Learning
- Grant Expected Outcomes
 1. Creating data dashboard and establishing a research office
 2. Completing the Early Childhood Education component of the P-20W SLDS

MDE's Research State



Early Learning Collaboratives

Mississippi's Early Learning effort

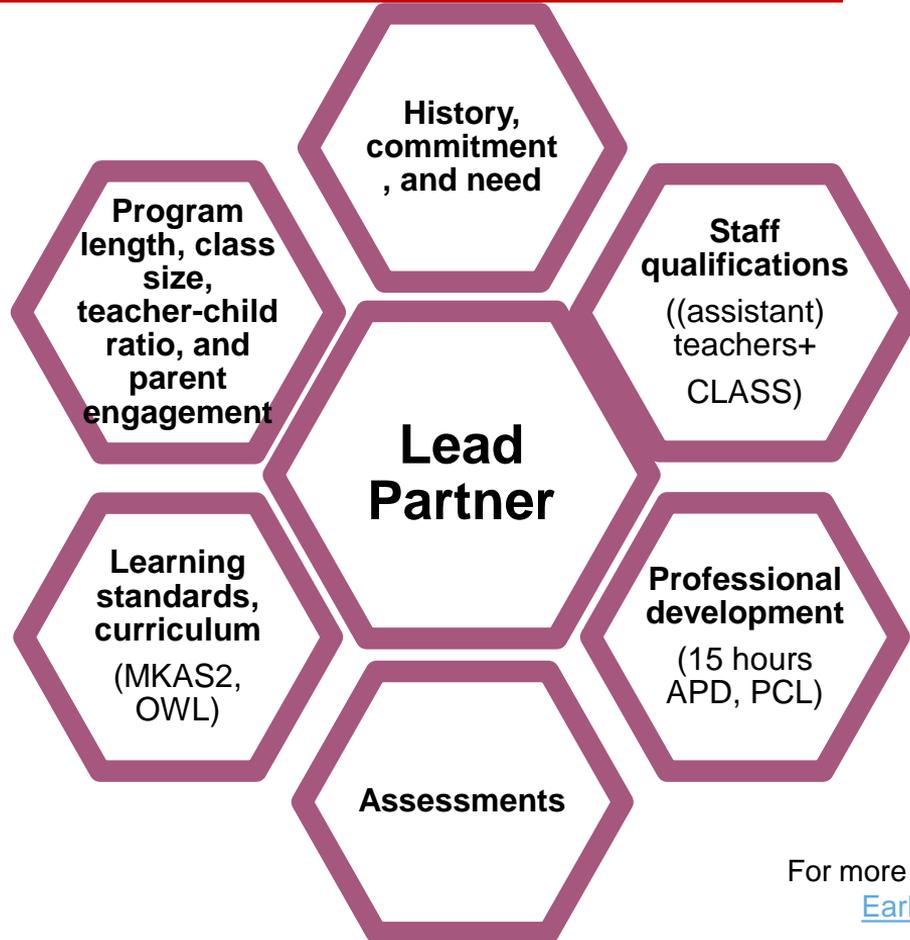
What is Mississippi's Early Learning Collaboratives?

- The Early Learning Collaborative Act of 2013, which became law on April 18, 2013, establishes Mississippi's first state-funded, voluntary Pre-K program on a phased-in basis.
- Provide funding (competitive basis) to local communities to establish, expand, support and facilitate the successful implementation of quality early childhood education and development services.
- The state provides \$2150 per full-time child enrolled. All state dollars must be matched on a 1:1 basis at the local level to make the total investment for each child enrolled in ELC \$4300.

MS Early Learning Collaboratives

- Public schools
- Head Start
- Private agencies (i.e. child care centers or non-profit organizations)
- Faith-based centers

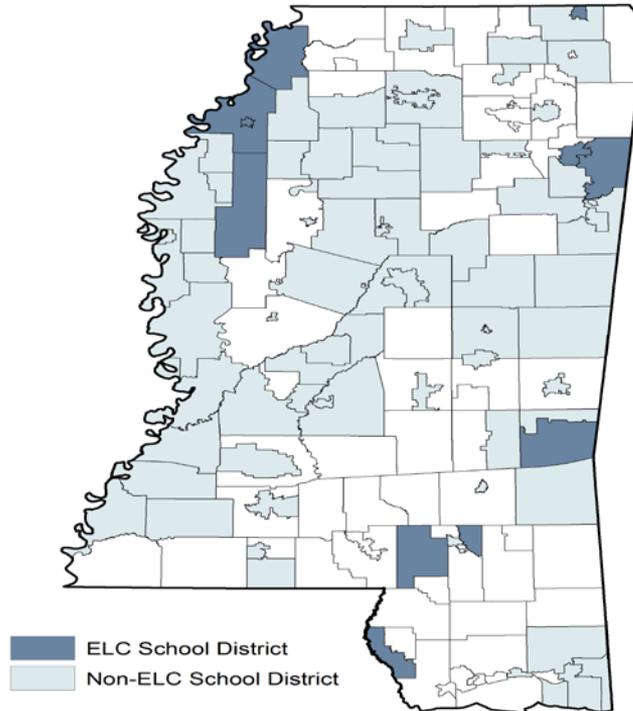
The majority of the ELCs are led by school districts, but some are led by nonprofit organizations. A few ELCs include multiple school districts.



MS Early Learning Collaboratives – Facts

School Year 2016-2017:

- 14 out of 144 school districts
- 11 out of 82 counties in the state
- All of the ELCs have Head Start partners
- Total number of children 1642 (717 in public schools, 837 in Head Start, others in other settings)
- Total fiscal year spending \$9,576,610 (Amount of total from state sources \$4,000,000, amount of total from required local sources \$4,000,000, and amount from non-required local sources \$1,576,610).
- Mississippi Early Learning Standards for Classrooms Serving Four-Year-Old Children
- One of the only five states meeting the majority of NIEER's quality standards three years in a row.



Location of ELC and Non-ELC Public Pre-K School Districts

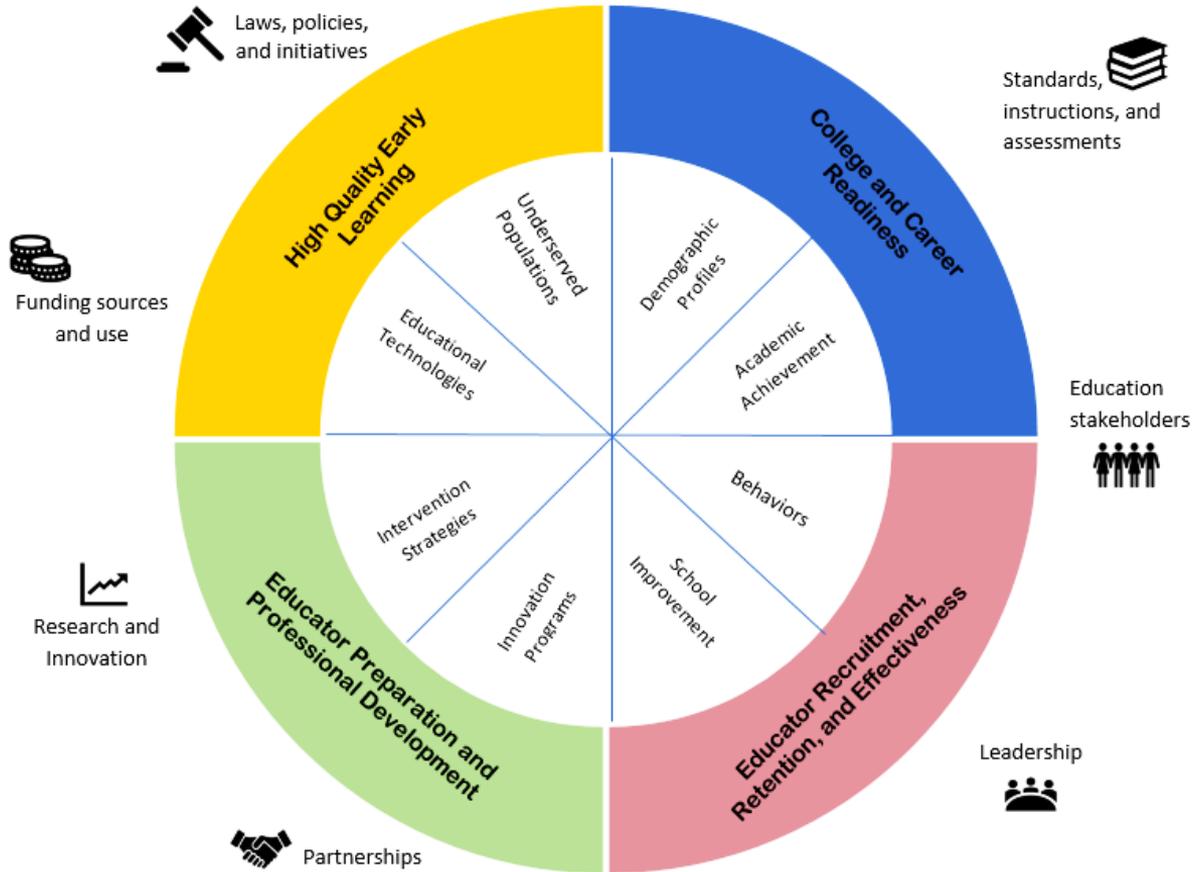
Research Study

Impact of Pre-Kindergarten Programs on Student Performance in Early Schooling in the State of Mississippi

Office of Research and Development

The Office of Research and Development (ORD) is committed to producing objective and accurate research and analytics. It transforms data into insights that inform the decision-making of the MDE leadership. ORD supports the broader mission of Mississippi State Board of Education strategic plan, to improve student achievement, and opportunities throughout Mississippi's education system.

Research Motivation: Alignment with MDE Research Framework



Research Questions

Does attending an Early Learning Collaborative (ELC) center improve preschoolers' kindergarten readiness?

1. Compare to students enrolled in other public PreK classrooms, how much more (or less) likely will students enrolled in ELCs program be “kindergarten-ready”?
2. How many more (or less) points will students enrolled in ELCs programs earn on average based on the Kindergarten Readiness assessment results?

What is the impact of ELCs program on student's performance over time? Is the impact increasing or decreasing since the program implemented?

Measure of Kindergarten Readiness

Kindergarten Readiness Assessment:

- Administered in fall (pre-test) and spring (post-test)
- Performance Levels: Early Emergent Reader (lowest), Late Emergent Reader, Transitional Reader, Probable Reader (highest)
- Scale score

- **Analytical Sample:** Students who attended an ELC Public Pre-K or a non-ELC Public Pre-K, and were twice tested using the Kindergarten Readiness Assessment, during the 2014-2015, 2015-2016, or 2016-2017 school years.
- **Treatment Group.** Students who attended an ELC Public Pre-K.
- **Comparison Group.** Students who attended a non-ELC Public Pre-K program, weighted so that their distributions on the following characteristics match those of the treatment group:

Gender	Race
Free/reduced-price lunch status	Special education status
English language learner status	Accountability status grade of school district
Pre-test performance Level/scale score	Regional location of school district
Year	

Overview of Findings

- An overall positive trend of relationship between ELC participation and the likelihood that a student will achieve proficiency as well as score higher on the Kindergarten Readiness Assessment from over two-year window (SY14-15 to SY16-17)
- With SY14-15 as the base year and other things being equal, a kid enrolled in an ELC public classroom is 7% more likely than his/her peer who enrolled in a non-ELC public classroom to achieve proficiency on the Kindergarten Readiness Assessment in SY16-17.
- With SY14-15 as the base year and other things being equal, a kid enrolled in an ELC public classroom in SY16-17 earned about 18 points more than his/her peer who enrolled in a non-ELC public classroom.

Descriptive Statistics

Table 1. Number of Observations of Public Pre-K Students taking the Kindergarten Readiness Assessment, by ELC Status (Unweighted)

Program Status	Number of Observations (Unweighted)
ELC (Total)	1,436
2014-2015	171
2015-2016	617
2016-2017	648
Non-ELC (Total)	11,870
2014-2015	3,346
2015-2016	3,659
2016-2017	4,865

Descriptive Statistics

Table 2. Performance of Public Pre-K Students on the Kindergarten Readiness Assessment, by ELC Status

Program Status	% Achieving a Proficient Score		Avg. Scale Score	
	Pre-Test	Post-Test	Pre-Test	Post-Test
ELC (Total)	17.15	77.00	428.71	576.39
2014-2015	15.09	55.97	415.80	511.45
2015-2016	16.67	79.30	430.81	576.55
2016-2017	18.15	80.36	430.13	593.29
Non-ELC (Total)	17.01	74.23	431.63	577.98
2014-2015	13.67	64.98	420.69	541.34
2015-2016	16.27	77.53	435.52	590.16
2016-2017	18.58	73.55	430.85	576.13

The percentage of achieving proficiency keeps rising for ELC public PreK students

The average scale score keeps rising for ELC public PreK students

Descriptive Statistics

Table 4. Performance of Public Pre-K Students on the Kindergarten Readiness Assessment, by ELC Status and Race

Program Status	% Achieving a Proficient Score		Avg. Scale Score	
	Pre-Test	Post-Test	Pre-Test	Post-Test
White				
ELC (Total)	21.07	80.86	438.91	585.7
2014-2015	21.11	63.33	430.54	527.54
2015-2016	18.59	83.64	438.33	585.12
2016-2017	23.17	83.49	441.8	602.81
Non-ELC (Total)	20.79	79.52	443.04	592.75
2014-2015	17.69	70.69	434.77	563.73
2015-2016	19.09	82.02	443.07	605.05
2016-2017	23.12	79.9	445.37	590.53
Black				
ELC (Total)	13.95	72.96	420.34	566.03
2014-2015	8.06	48.39	397.71	493.69
2015-2016	15.24	74.35	425.31	565.72
2016-2017	14.01	77.43	420.59	583.81
Non-ELC (Total)	13.77	69.96	418.42	559.35
2014-2015	9.37	54.88	404.77	504.38
2015-2016	13.9	72.97	424.1	567.69
2016-2017	14.7	70.46	415.77	563.89



Methodologies

- **Qualitative:** Probit regression of whether students achieved a proficient Kindergarten Readiness Assessment Score on their ELC status.
- **Quantitative:** OLS regression of students' Kindergarten Readiness Assessment post-test scale score on their ELC status.

Post – Test Performance

$$= \beta_0 + \beta_1 ELC + \theta_1 yr16 + \delta_1 ELC * yr16 + \theta_2 yr17 + \delta_2 ELC * yr17 + \beta_2 female + \beta_3 FRL + \dots + \mu$$

- **Control variables** included in regressions: pre-test performance, gender, race, free/reduced-price lunch status, special education status, English language learner status, accountability grade of student's school district, language proficiency, accountability status grade of student's school district, regional location of student's school district, **time dummies**, and interaction terms between the time dummy and the ELC variable.

Findings – Probit Estimation

The Beginning Is The Hardest:

ELC public PreK students less likely to achieve proficiency during the first year, but situation has changed since then.

Variables of Interest	Coefficient	SE	Marginal Effect
ELC	-0.27*	0.12	-0.08
Year (2014-2015 as Reference)			
2015-2016	0.48***	0.12	0.14
2016-2017	0.35**	0.12	0.10
ELC-Year Interactions			
ELC*2015-2016	0.34*	0.14	0.10
ELC*2016-2017	0.53***	0.14	0.15

These results indicate that ELC students were significantly less likely than other Public Pre-K students to achieve proficiency on the Kindergarten Readiness Assessment in 2014-2015 but were significantly more likely to in 2015-2016 and 2016-2017.

Note: † p<.10; * p<0.05; ** p<0.01; *** p<0.001.

Findings – Pooled OLS Estimation

ELC public PreK students scored less during the first year, but scored more in the third year.

Variables of Interest	Coefficient	SE
ELC	-26.337***	7.67
Year (2014-2015 as Reference)		
2015-2016	38.306***	7.46
2016-2017	26.328***	7.31
ELC-Year Interactions¹		
ELC*2015-2016	16.147!	8.67
ELC*2016-2017	44.010***	8.61

¹ELC-Year interaction variables jointly significant at the $p < 0.0001$ level.

Note: † $p < .10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Policy Indications

- There is an overall positive trend of relationship between ELC participation and the likelihood that a student will achieve proficiency as well as score higher on the Kindergarten Readiness Assessment.
- The effect of ELC participation on Kindergarten Readiness Assessment outcomes grew more positive between 2014-2015 and 2016-2017. This could reflect a maturing of the program and resultant increase in program quality.

Concluding Remarks and Questions



MISSISSIPPI
DEPARTMENT OF
EDUCATION

Ensuring a bright future for every child



MISSISSIPPI STATE UNIVERSITY™
NATIONAL STRATEGIC PLANNING
& ANALYSIS RESEARCH CENTER

John Kraman

Chief Information Officer
Mississippi Department of Education
Jkraman@mdek12.org

Yan Li, Ph.D.

Director, Office of Research and Development
Mississippi Department of Education
YLi@mdek12.org

Domenico “Mimmo” Parisi, Ph.D.

Executive Director
National Strategic Planning and Analysis Research
Center
Mississippi State University
mparisi@nsparc.msstate.edu