The Eleventh Hour Rally for College Readiness

The Association Between Achievement on Kentucky's College Readiness Assessments and the Delivery Methods of Interventions for Underprepared Twelfth Grade Mathematics Students

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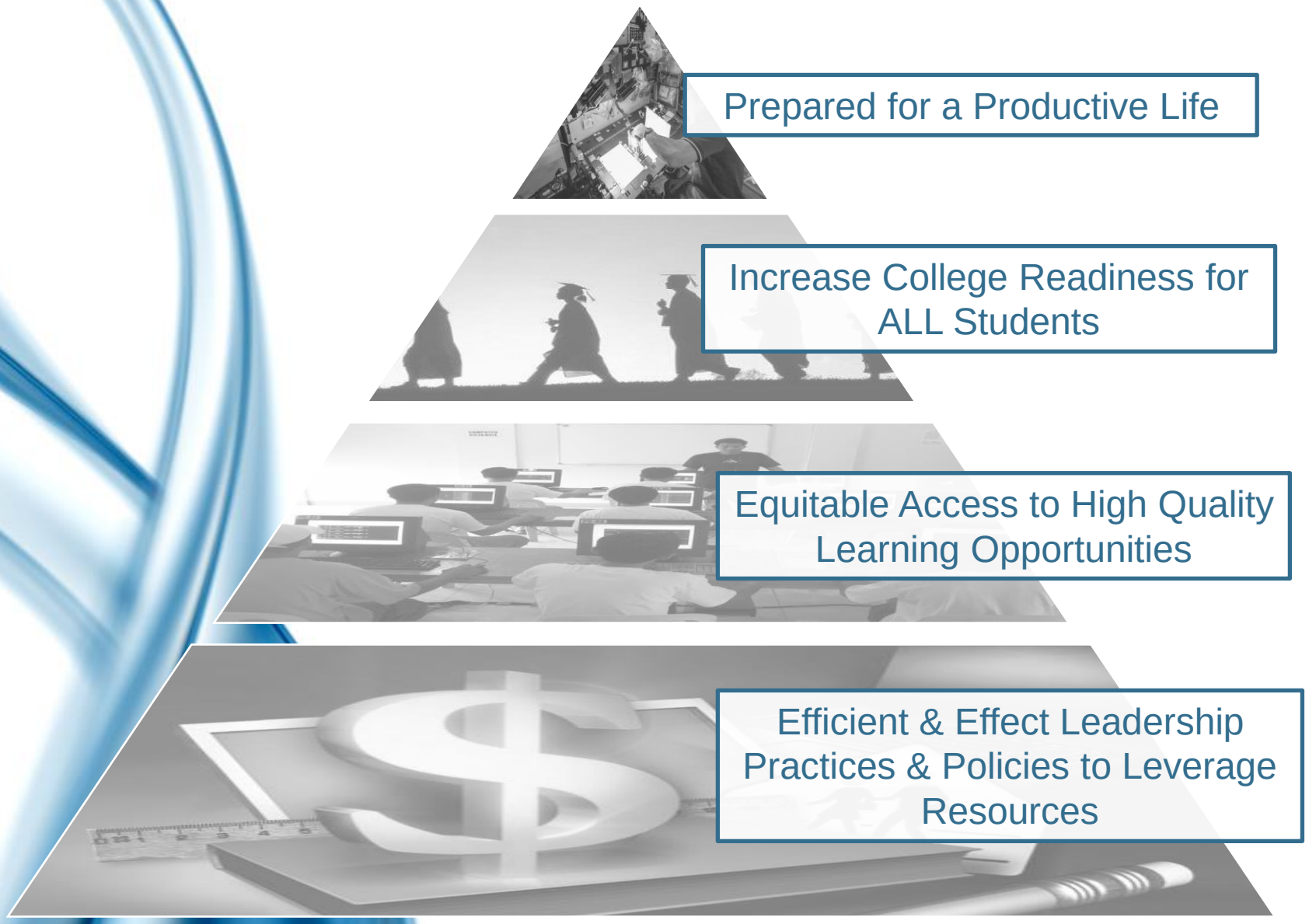
WHY?



Prepared for a Productive Life

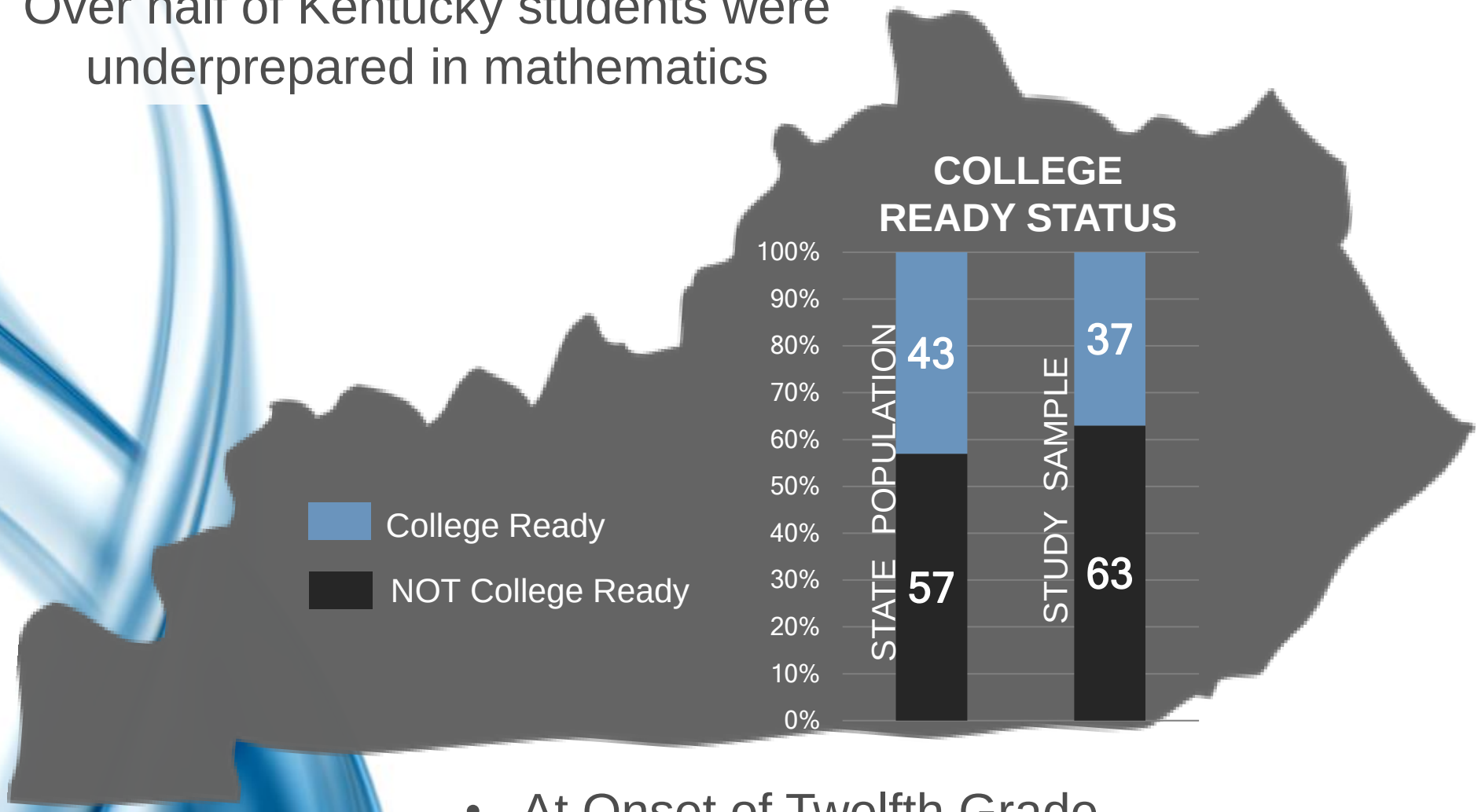
Increase College Readiness for ALL Students

Equitable Access to High Quality Learning Opportunities

Efficient & Effect Leadership Practices & Policies to Leverage Resources

Problem

Over half of Kentucky students were underprepared in mathematics



- At Onset of Twelfth Grade
- After Required Core Math Classes

Purpose

This retrospective quantitative research study sought to determine the association between achievement on Kentucky's three college readiness assessments and the accelerated learning intervention delivery method in which underprepared twelfth grade students participated: (1) face-to-face only; (2) online or computer assisted tutoring; or (3) blended learning tutoring.

Significance

The findings of this study can provide evidence for educational leaders and policy makers to leverage resources, implement practices and policies to increase college readiness.

Research Question #1

Q1: What is the **association between achievement on the ACT college readiness assessment and the accelerated learning intervention delivery method** in which underprepared twelfth grade students were provided during their twelfth grade year: (1) face-to-face tutoring only;(2) online tutoring only; or (3) blended learning tutoring?

$H1_0$
There will be no association…

$H1_a$
There will be an association…

Research Question #2

Q2: What is the **association between achievement on the COMPASS college readiness assessment and the accelerated learning intervention delivery method** in which underprepared twelfth grade students were provided during their twelfth grade year: (1) face-to-face tutoring only; (2) online tutoring only; or (3) blended learning tutoring?

$H2_0$
There will be no association…

$H2_a$
There will be an association…

Research Question #3

Q3: What is the **association between achievement on the KYOTE college readiness assessment and the accelerated learning intervention delivery method** in which underprepared twelfth grade students were provided during their twelfth grade year: (1) face-to-face tutoring only; (2) online tutoring only; or (3) blended learning tutoring?

$H3_0$
There will be no association…

$H3_a$
There will be an association…

Research Question #4

Q1: What is the **association between achievement on the ANY college readiness assessment and the accelerated learning intervention delivery method** in which underprepared twelfth grade students were provided during their twelfth grade year: (1) face-to-face tutoring only; (2) online tutoring only; or (3) blended learning tutoring?

$H4_0$
There will be no association…

$H4_a$
There will be an association…

College Readiness Policy

NCLB/ESEA/ESSA

Senate Bill 1

KRS 158.6459

704 KAR 3:305

School, District & State Policies

Resource Allocations

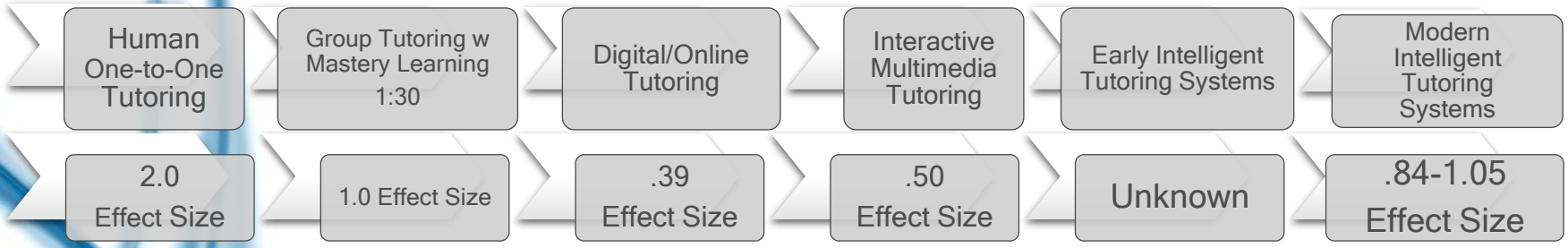
Student Placement

Master Scheduling

Staff Assignments

Review of Literature Findings

Evolution of Tutoring with Effect Sizes.

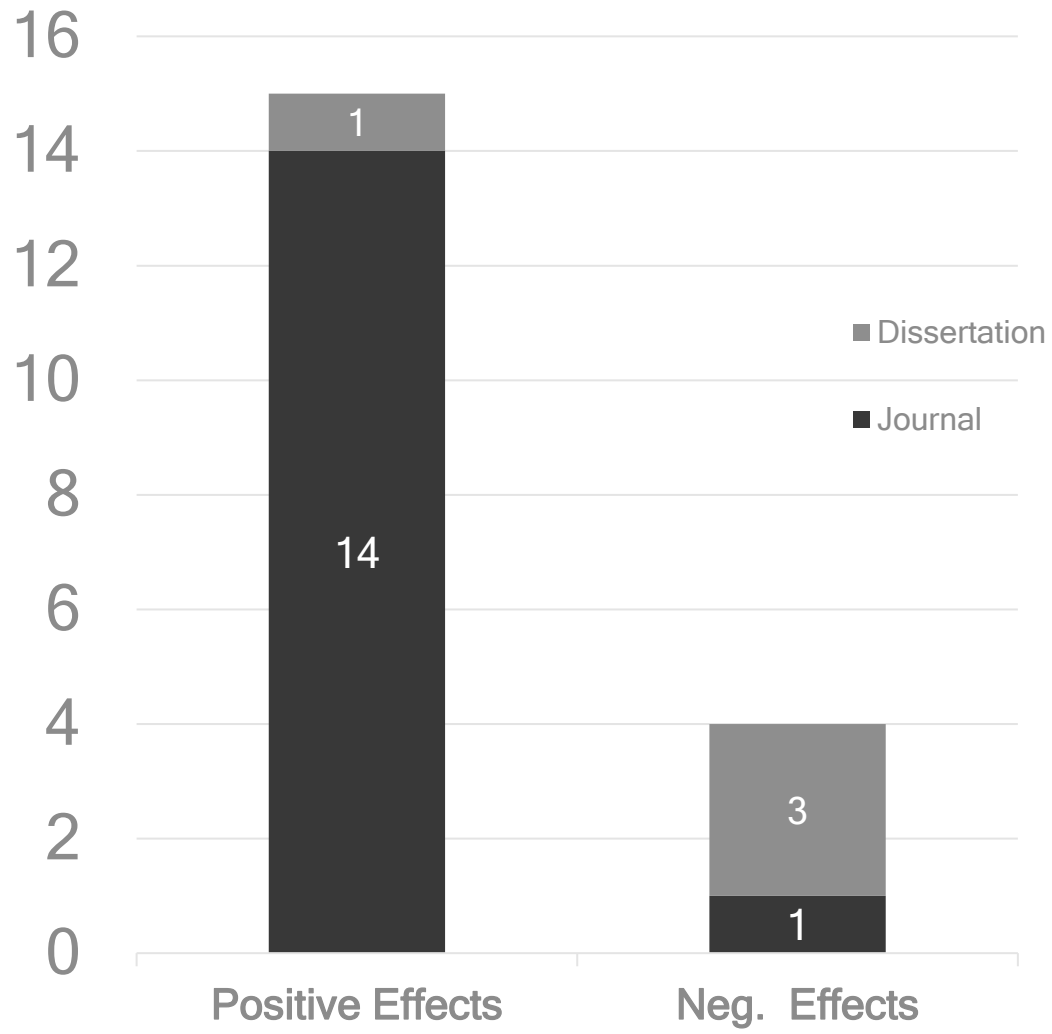


(Bloom, 1984, Dolenc, Aberšek, & Aberšek, 2015)

Review of Literature Findings

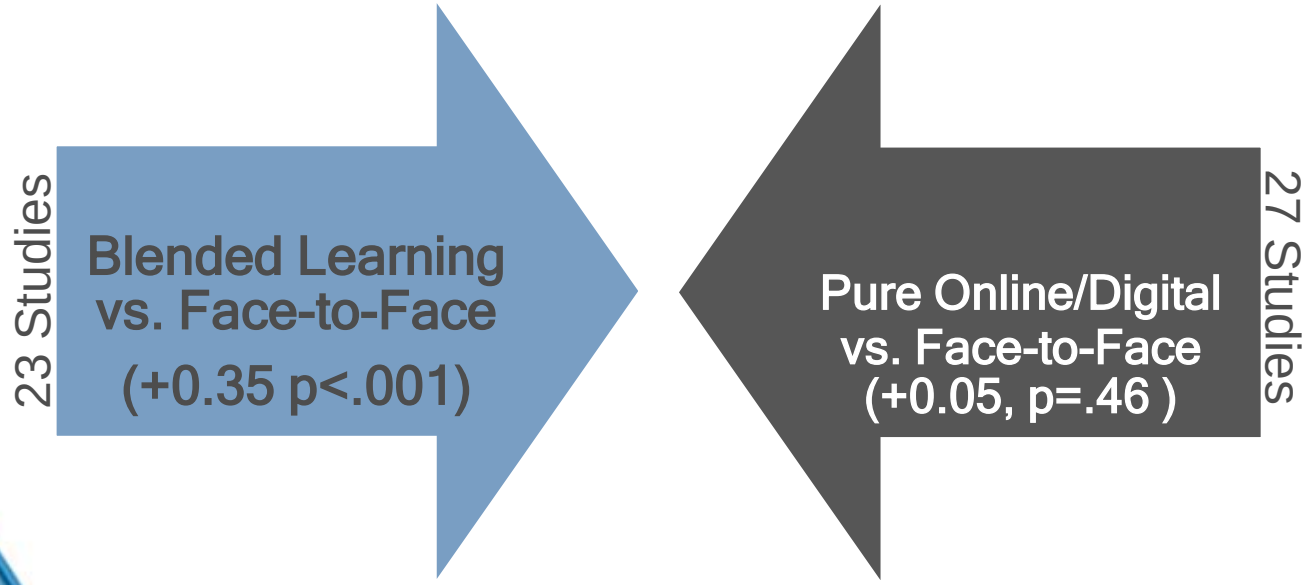
The number of studies showing impact on:

- Learner Outcomes
- State Test scores
- Pre/Post Unit Tests
- Student Autonomy
- Student Opinions

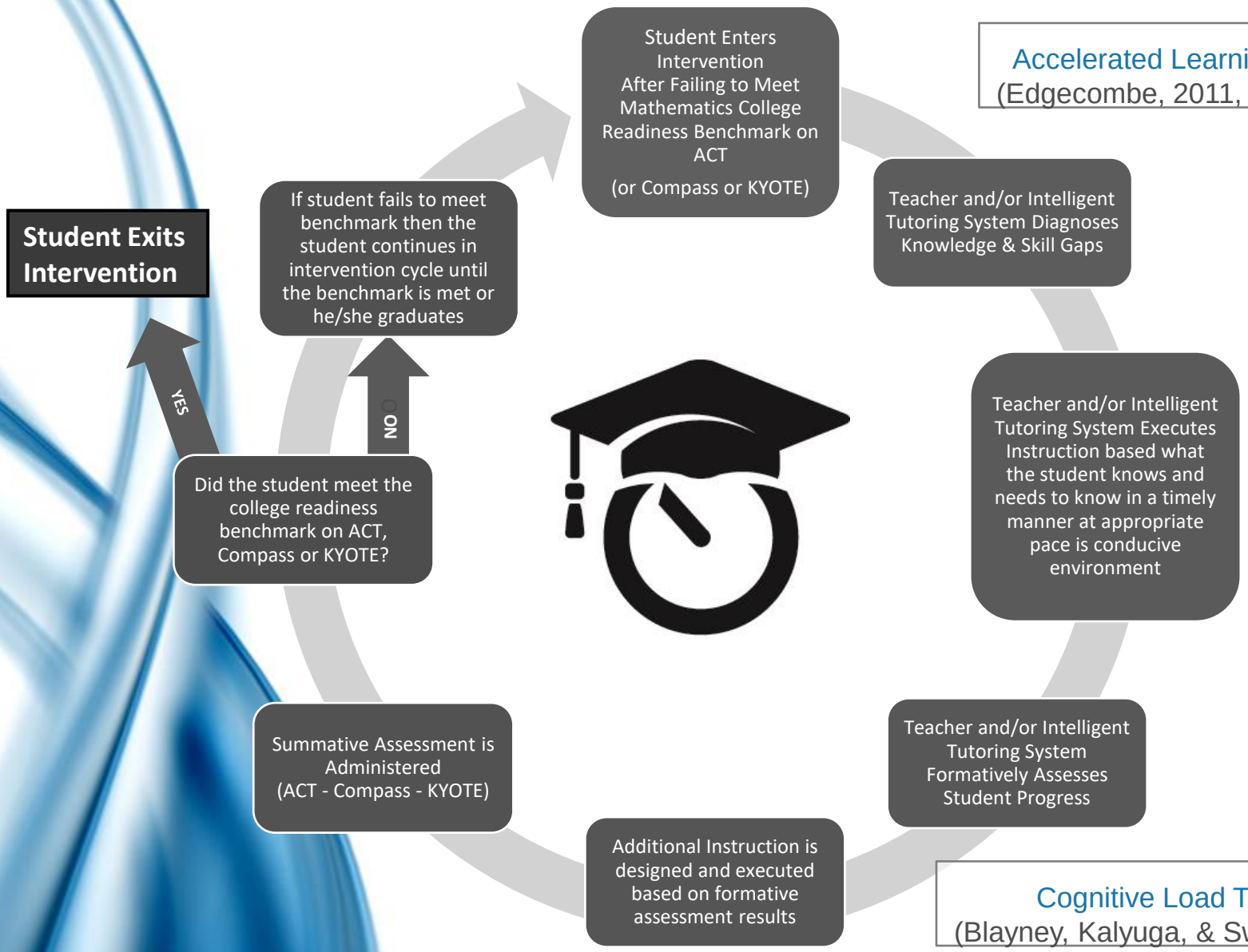


Review of Literature Findings

Instructional Delivery Method Effect Sizes



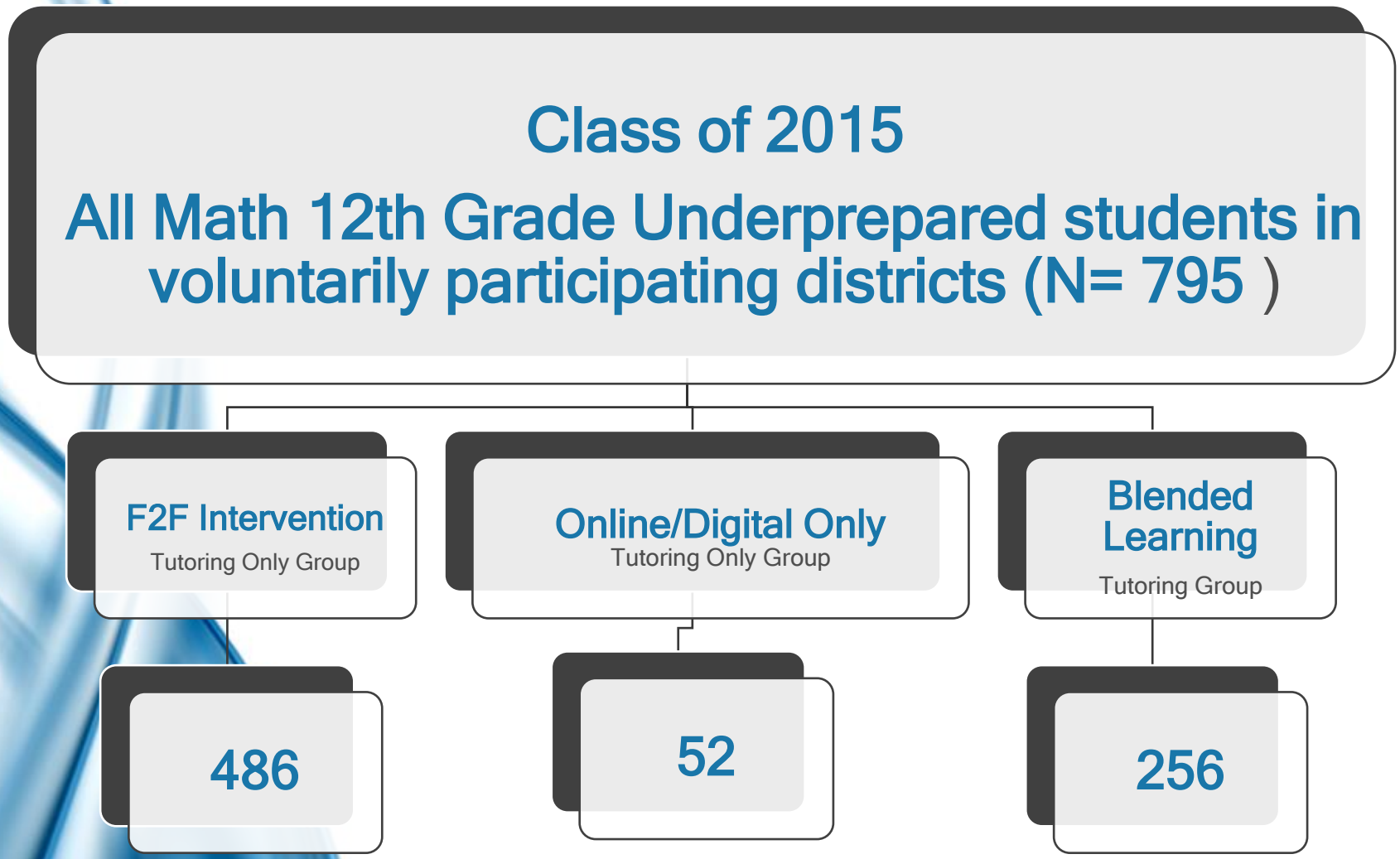
Theoretical Framework Applied



Accelerated Learning Theory
(Edgecombe, 2011, Imel, 2002)

Cognitive Load Theory
(Blayney, Kalyuga, & Sweller, 2015)

Participants & Setting



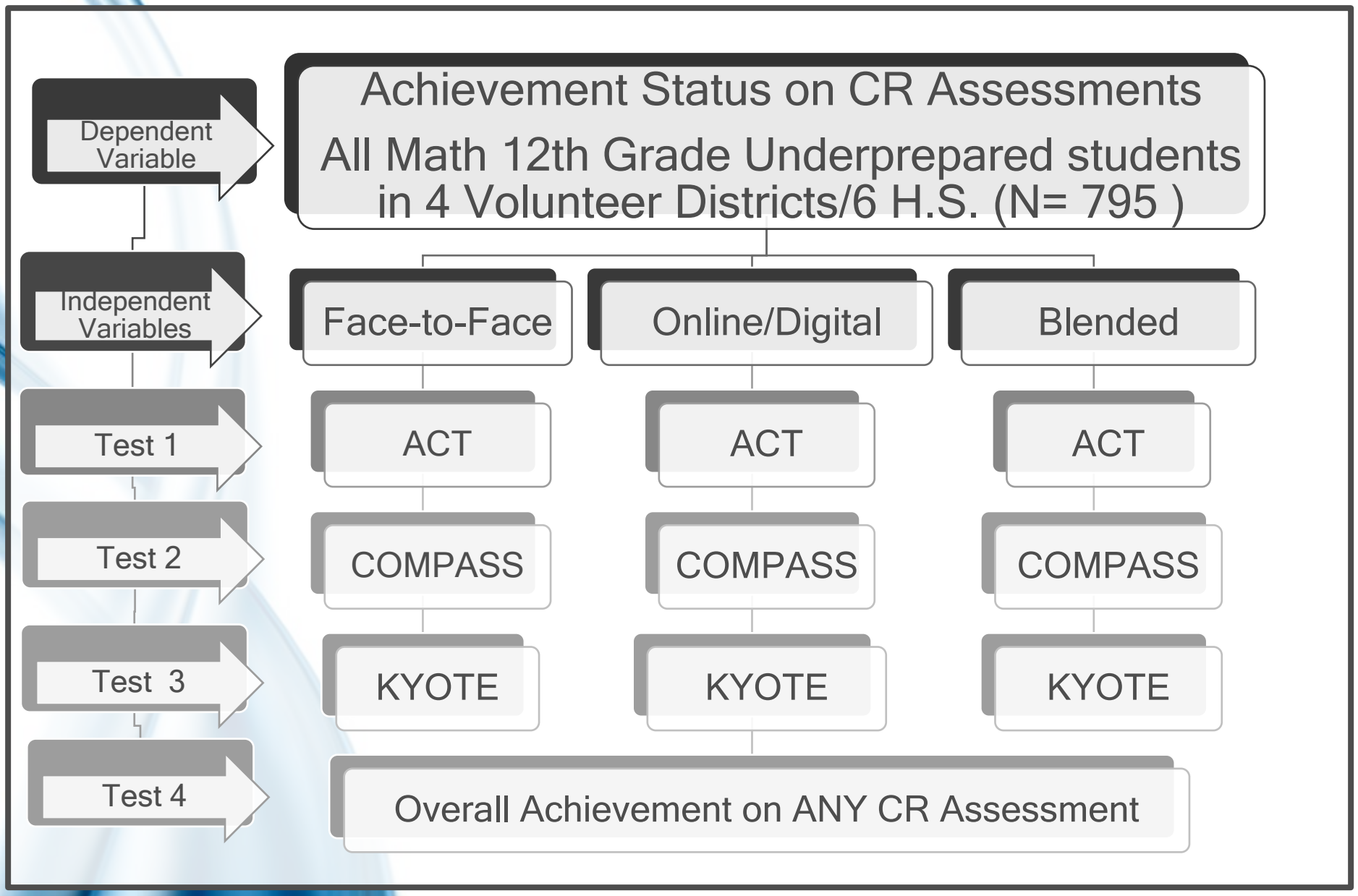
Assumptions

- Delivered by Certified teachers
- 5 hours per week
- Curriculum aligned to state approved standards
- 70/30 to a 60/40 split of F2F/ONDL
- Accelerated learning (Individualized)

Limitations

- Student socioeconomic background
- Duration of the intervention
- Teacher quality of the intervention
- Low number of participating districts and schools
- No control for # of test retakes per student.
- Small Sample Sizes
- Possible Human Data Entry Error in I.C.
- 3 Different Types of College Readiness Tests
- Digital Learning Small Sample Sizes
- Different Types of Software Used

Research Design



Methodology

Statistical Test	Purpose
Descriptive Statistics	Mean Scale Scores for Each Delivery Method for Each College Readiness Assessments
Bivariate Correlation	Correlation of the Three College Ready Assessments
Chi Square	To Determine the Statistical Significance of the Association Between Variables

Findings RQ #1

Blended Learning Tutoring Associated with Greatest Mean Scale Score on ACT

Delivery Method	Mean	N	Std. Deviation
Face-to-Face Tutoring Only	16.28	477	1.548
Online/Digital Tutoring Only	15.30	43	1.846
Blended Learning Tutoring	**16.90**	245	3.120

Findings RQ #1

Significant Association Between ACT and Intervention Delivery Method

Met Benchmark on ACT Math		F2F	ON/DL	Blended	Total
No	Count	462	42	216	720
	% within Delivery Method	96.9%	97.7%	88.2%	94.1%
Yes	Count	15	1	29	45
	% within Delivery Method	3.1%	2.3%	11.8%	5.9%
Total	Count	477	43	245	765
	% within Delivery Method	100 %	100%	100%	100%

$$X^2(2, N = 765) = .000, p < .05.$$

Discussion RQ #1 (ACT)

Significant Association Between ACT Achievement and Intervention Delivery Method

- Least Utilized Test
- ONLY 6% Achieved College Readiness
- Blended Learning – Greatest Mean Score
- Blended Learning 4X More CR Achievement Status
- Pure Online/Digital Produced Least Achievement

Findings RQ #2

Blended Learning Tutoring Associated with Greatest Mean Scale Score on COMPASS

Delivery Method	Mean	N	Std. Deviation
Face-to-Face Tutoring Only	29.45	229	8.499
Online/Digital Tutoring Only	25.46	13	4.684
Blended Learning Tutoring	**37.78**	179	15.768

Findings RQ #2

Significant Association Between COMPASS and Intervention Delivery Method

Met Benchmark on COMPASS Math		F2F	ON/DL	Blended	Total
No	Count	180	13	122	315
	% within Delivery Method	78.6%	100.0%	59.2%	70.3%
Yes	Count	49	0	84	133
	% within Delivery Method	21.4%	0.0%	40.8%	29.7%
Total	Count	229	13	206	448
	% within Delivery Method	100.0%	100.0%	100.0%	100.0%

$$X^2(2, N = 448) = .000, p < .05.$$

Discussion RQ #2 (COMPASS)

Significant Association Between COMPASS Achievement and Intervention Delivery Method

- 2ND Least Utilized Test (Phased Out)
- 29% Achieved College Readiness
- Blended Learning – Greatest Mean Score
- Blended Learning 2X More CR Achievement Status
- Pure Online/Digital Produced Least Achievement

Findings RQ #3

Blended Learning Tutoring Associated with Greatest Mean Scale Score on KYOTE

Delivery Method	Mean	N	Std. Deviation
Face-to-Face Tutoring Only	17.63	294	6.066
Online/Digital Tutoring Only	13.19	16	6.442
Blended Learning Tutoring	18.34	109	5.323

Findings RQ #3

No Significant Association Between KYOTE and Intervention Delivery Method

Met Benchmark on KYOTE Math		F2F	ON/DL	Blended	Total
No	Count	194	13	71	278
	% within Delivery Method	66.0%	81.3%	65.1%	66.3%
Yes	Count	100	3	38	141
	% within Delivery Method	34.0%	18.8%	34.9%	33.7%
Total	Count	294	16	109	419
	% within Delivery Method	100.0%	100.0%	100.0%	100.0%

$$X^2(2, N = 419) = .474\ ,\ p < .05.$$

Discussion RQ #3 (KYOTE)

No Significant Association Between KYOTE Achievement and Intervention Delivery Method

- Most Utilized Test
- 34% Achieved College Readiness
- Blended Learning – Greatest Mean Score
- Blended Learning & F2F Produced Almost Equivalent Achievement Status
- Pure Online/Digital Produced Least Achievement

Findings RQ #4

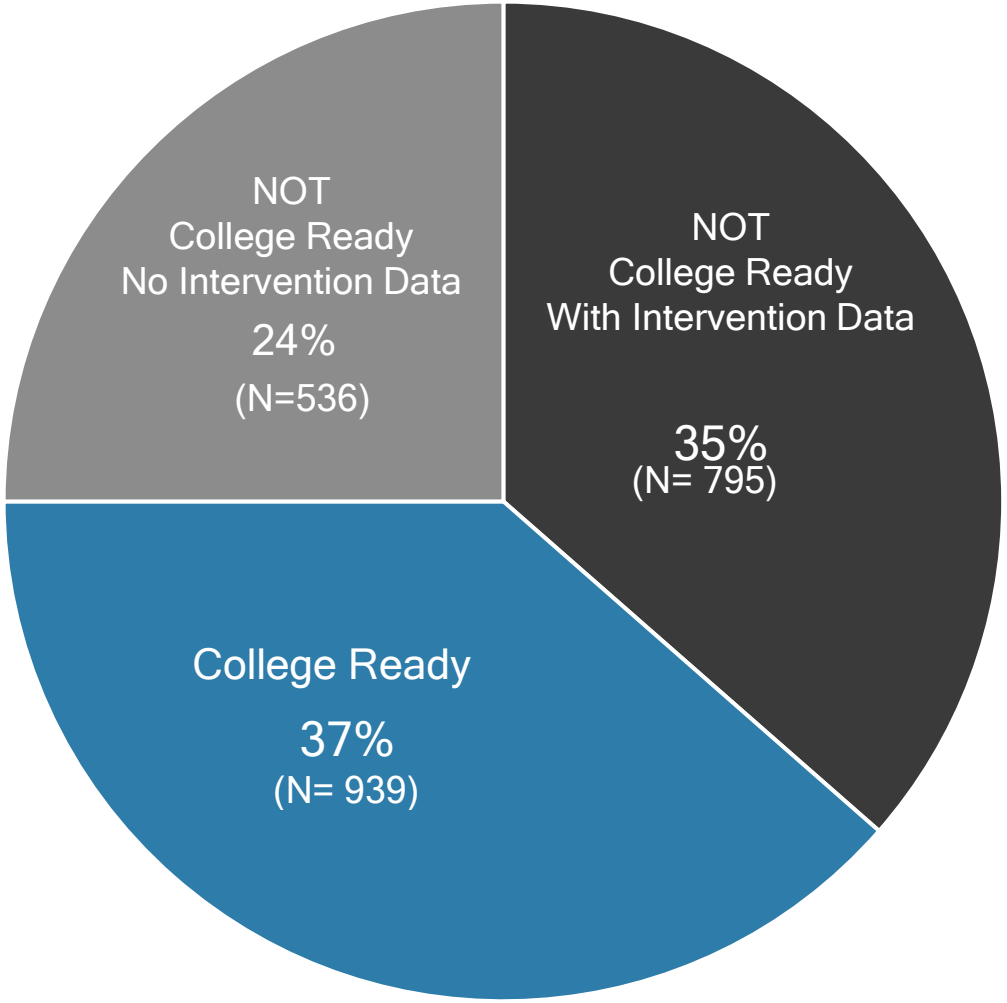
Significant Association Between ANY Assessment and Intervention Delivery Method

Met Benchmark on ANY Math		F2F	ON/DL	Blended	Total
No	Count	337	48	124	509
	% within Delivery Method	69.3%	92.3%	48.4%	64.1%
Yes	Count	149	4	132	285
	% within Delivery Method	30.7%	7.7%	51.6%	35.9%
Total	Count	486	52	256	794
	% within Delivery Method	100.0%	100.0%	100.0%	100.0%

$$X^2(2, N = 794) = .000, p < .05.$$

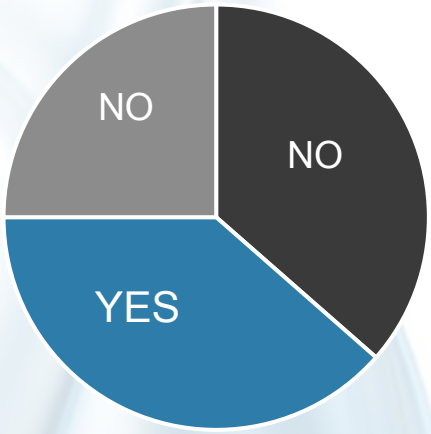
Discussion RQ #4 (ANY)

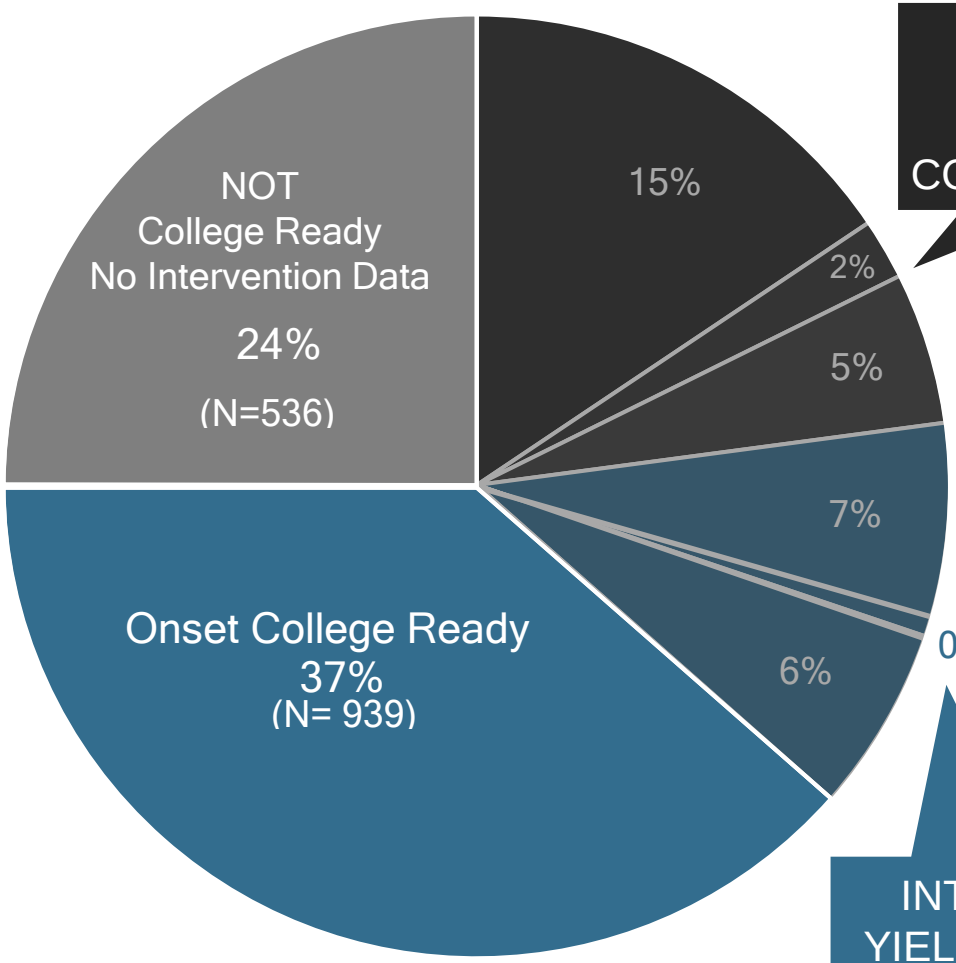
College Readiness at Onset of Twelfth Grade Year



Discussion RQ #4 (ANY)

College Readiness At the End of Twelfth Grade





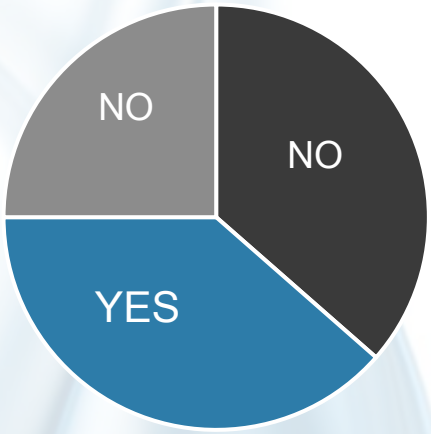
22%
STILL NOT
COLLEGE READY

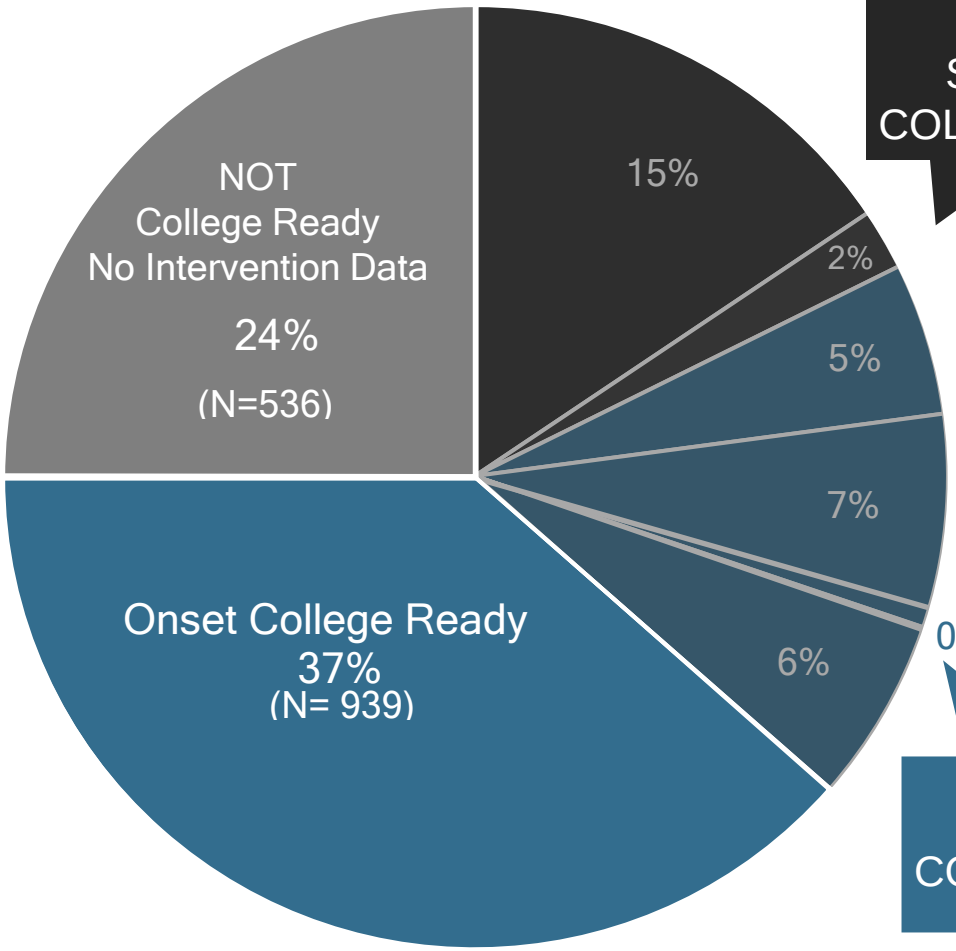
INTERVENTIONS
YIELDED 13% MORE
COLLEGE READY

Discussion RQ #4 (ANY)

WHAT-IF?

College Readiness At the End of Twelfth Grade



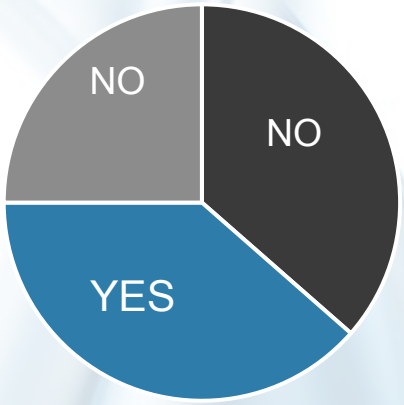


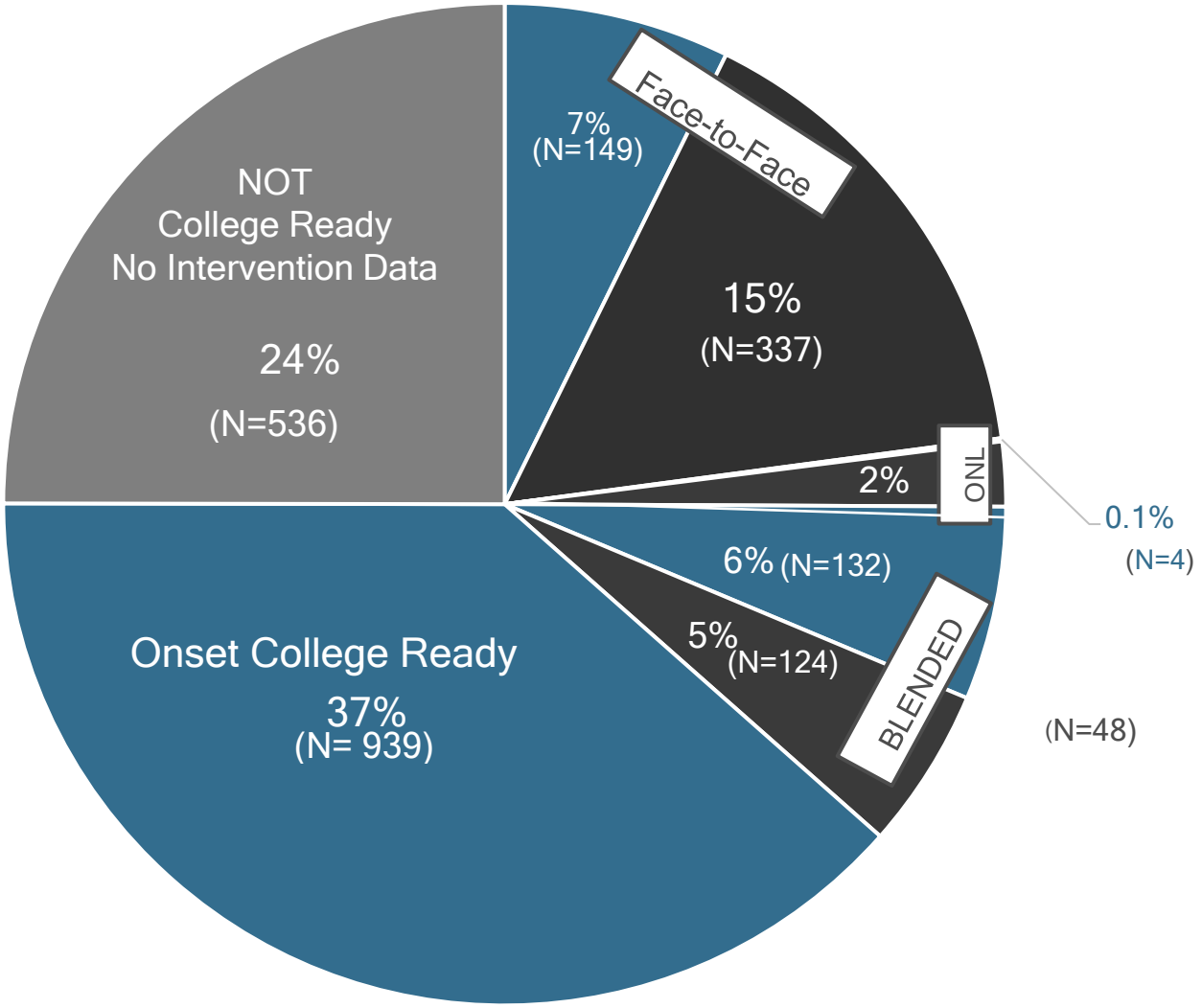
17%
STILL NOT
COLLEGE READY

22% YIELD
COLLEGE READY

Discussion RQ #4 (ANY)

College Readiness Interventions Comparisons





Cost Benefit Analysis

5 Hours of Tutoring Per Week	Hourly	Weekly	Semester	Yearly
1:1 Face-to-Face (5 hrs)	$39.00	$195.00	$2,106.00	$4,212.00
30:1 Face-to-Face (5 hrs)	$1.30	$6.50	$117.00	$234.00
Online/Digital Only (5 hrs) *	$0.17	$ 0.86	$15.50	$31.00
Blended Learning (2 hrs of 30:1 F2F + 3 hrs of Online)	---	$3.11	$55.98	$111.96

Cost Benefit Analysis for 1 Semester of Interventions

Delivery Method	Cost	# of Students	Total Cost	% College Ready	# College Ready
Face-to-Face (30:1)	$117.00	486	$39,429.00	30.7	149
Online/Digital (1:1)	$15.50	52	$744.00	7.7	4
Blended (30:1)	$55.98	256	$6,941.52	51.6	132

Implications: Leadership Practice

- CPE ACT benchmarks are not always high enough for college acceptance, scholarships, or sports eligibility – while KYOTE or COMPASS are college readiness indicators and placement tests they are not used in place of ACT requirements by colleges or sports.
- Blended Learning is associated with greatest achievement on college readiness assessments
- Most of students achieved college readiness status on KYOTE test

Recommendations: Leadership Practice

- Provide Staff Professional Learning: (Accelerated Learning for Interventions & Blended Learning)
- Leverage staff instructional assignments and master schedules to place highly effective certified teachers in dedicated intervention class periods.
- Allocate funds to purchase technology and evidence based mathematics software
- Implement data driven PLCs – progress monitoring and intentional tracking of 12th grade retakes of ALL assessments
- Place 9th grade students in needs-based placement mathematics course pipeline

Recommendations: Education Policy

School Level:

- SBDM adopt curriculum with both state standards and college readiness standards
- Student Math Pipeline Placement & Intervention Placement Policies aligned to College Readiness Regs

District Level:

- Intervention Policies Aligned to College Readiness Regs
- Digital Learning Policies based on KY Digital Learning Guidelines

State Level:

- Digital Learning Policies based on KY Digital Learning Guidelines

Future Study

- SES Background & Gap Groups
- Impact on different achievement level groups
- Intervention Duration
- College Readiness Assessments
- Software Type
- Statewide Study Examine Diversity

Conclusions

Blended Learning tutoring was associated with the greatest achievement on any of Kentucky's college readiness assessments,

- Blended learning interventions should be provided to all underprepared twelfth grade students to increase the attainment of college readiness status.

Blended learning requires equitable access to adequate technologies and educator capacity for implementation.

- Education leaders should leverage all human, time, and fiscal resources to provide equitable access for all students.

Policy makers and educational governing bodies should design and develop state and national policies to direct funds and guide aligned acts of improvement necessary for college readiness for all students.

Questions