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SCALING-UP TIER 2 INTERVENTION: LESSONS LEARNED

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SMU | THE INSTITUTE FOR READING RESEARCH

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Overarching Questions

1. Do results of previously validated Tier 2 reading interventions generalize in real world contexts?
2. What are barriers and facilitators to research-supported educational practices being implemented wide-scale in schools?

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Overview of the Research

Study1: Generalization of *Responsive Reading* in Suburban & Rural context.

Study 2: Generalization of *Early Interventions in Reading* in Urban & Rural Low SES contexts

Study 3: Measuring the Impact of Implementation Fidelity on student outcomes

Study 4: Contextual factors impacting student outcomes

What is Being Scaled-Up

If progress is inadequate, move to next level.

Tier 1: Quality Core

Enhanced general education classroom instruction.

Tier 2: Secondary Intervention

Child receives more intense intervention in general education, presumably in small groups.

Tier 3: Tertiary

Intervention increases in intensity and duration. Support typically needed across years.

Scaling Two Intervention

Responsive Intervention

(Denton & Hocker, 2005)

- Systematic, explicit instruction in synthetic phonics & analogy phonics
- Students apply decoding, fluency, & comprehension skills while reading/ writing
- Teachers respond to student needs documented through assessment
- Leveled text (decodable can be integrated)

Early Interventions in Reading

(Mathes & Torgesen, 2005)

- Explicit instruction in synthetic phonics, with emphasis on fluency and comprehension strategies.
- Decodable text
- Carefully constructed scope and sequence designed to prevent possible confusions
- Daily Lessons are prescriptive
- Lessons are fully Specified

**Prepublication title = Proactive Reading.

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Previous Research Results

- Students in both interventions performed significantly better than at-risk students in the same school who did not receive the interventions in *phonological awareness*, *word reading*, and *oral reading fluency*.
- *Both interventions were equally effective*

Mathes, P. G., Denton, C. A., Fletcher, J. M., Anthony, J. L., Francis, D. J., & Schatschneider, C. (2005). The effects of theoretically different instruction and student characteristics on the skills of struggling readers. *Reading Research Quarterly*, 40, 148-182.

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Four Year Longitudinal project (2004-08)

- Following schools and teachers.
- New cohort of 1st-grade students each year.
- 86 Schools in the Dallas/Fort Worth and Austin areas.
- Farthest North-Farthest South: 255 Miles
- Farthest East-Farthest West: 105 Miles
- Schools had a choice of intervention
- Large urban, suburban, and very small rural districts

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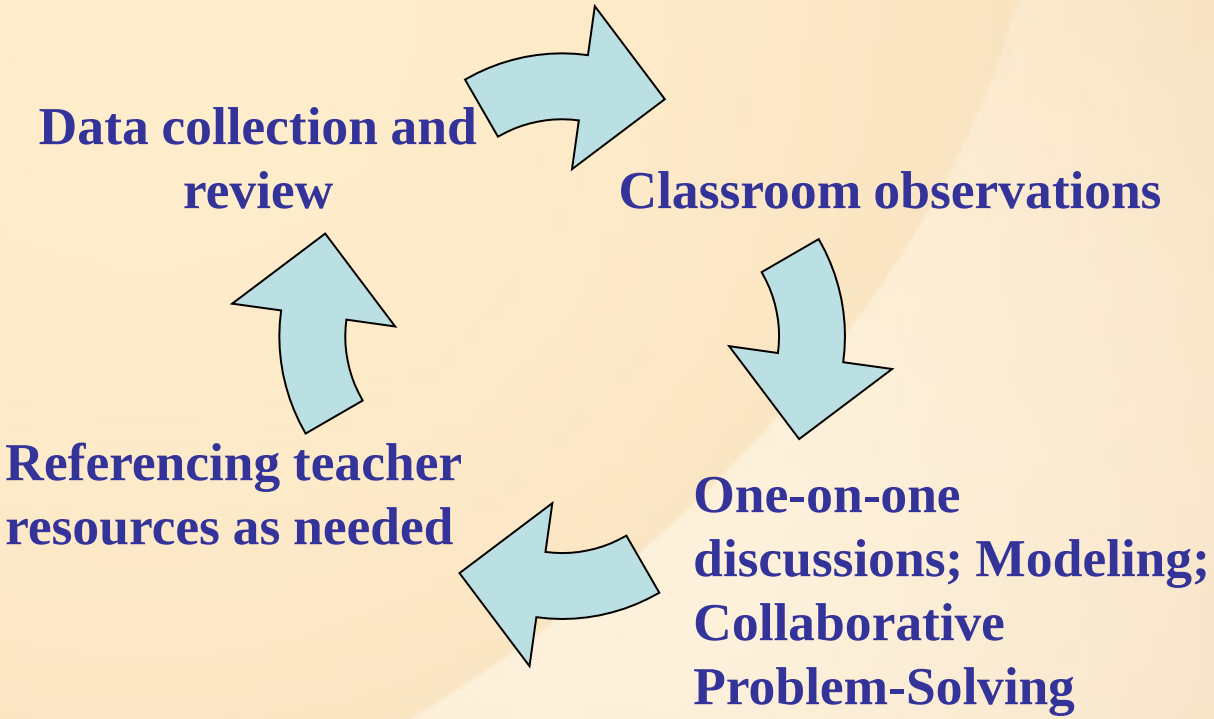
Research Design

- Students within building assigned randomly to EIR/RRI or typical practice.
- Teachers in each intervention assigned randomly to 1 of 3 coaching conditions.
  - **On-Site:** Monthly coaching sessions
  - **Virtual Coaching:** Sessions via the computer – text based.
  - **On-Demand:** Teacher requested support (the contrast condition)

The Coaching Process



Based on the Student-Focused-Coaching model -- Hasbrouck, J. E., & Denton, C. (2005). *The reading coach: A how-to manual for success*. Boston: Sopris West.

Results

Clear Selection Bias

Suburban Districts

- 100% chose to implement *Responsive Reading*

Urban Districts

- 100% chose to implement *Early Interventions in Reading*

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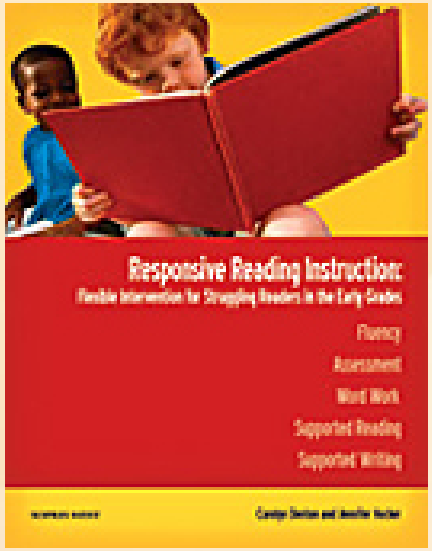
Clear Selection Bias Resulting in Very Different Samples

Suburban Districts

- Nearly all chose to implement *Responsive Reading Intervention (Denton & Hocker, 2005*



Urban Districts

- Nearly all chose to implement *Early Interventions in Reading (Mathes & Torgesen, 2005)*

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Study 1: Generalization of Responsive Reading Instruction (RRI)

- RRI implemented in 31 schools across 2 years.
- Students at-risk for reading difficulties at each school were randomly assigned to receive the research intervention (RRI; *n* = 182) or typical practice (TP; *n* =240).
- 43% of the TP students received an alternate school-provided intervention.
- Students in the RRI group had significantly higher outcomes than those in the TP group on multiple measures.
- Over 90% of RRI students met word reading criteria for adequate intervention response, but fewer met a fluency benchmark.

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RRI End of Year Observed Score Means and Standard Deviations, Estimated Means, and Effect Sizes

	RRI (*n*=182)				Typical Practice (*n*=240)			*Effect s*
Measure	***M***	***SD***	***EM***		***M***	***SD***	***EM***	
CTOPP Blending Words	**14.21****	**3.04**	**14.27**		**13.43**	**3.27**	**13.43**	**.27**
CTOPP Segmenting Words	**9.69**	**2.83**	**9.70**		**9.33**	**3.61**	**9.31**	**.12**
TOWRE Sight Word Eff.	**27.92*****	**10.67**	**27.86**		**23.28**	**10.34**	**23.21**	**.47**
TOWRE Nonwords	**10.63*****	**6.21**	**10.59**		**8.14**	**5.64**	**8.09**	**.44**
WJ III Letter Word Id	**438.08*****	**18.04**	**438.00**		**424.58**	**20.72**	**424.40**	**.72**
WJ III Word Attack	**473.33*****	**17.54**	**473.32**		**465.38**	**18.96**	**465.15**	**.46**
WJ III Passage Comp.	**455.78*****	**14.06**	**455.61**		**447.34**	**17.23**	**447.40**	**.53**
WJ III Spelling	**457.96*****	**12.43**	**457.80**		**449.72**	**14.63**	**449.90**	**.63**
Oral Reading Fluency	**31.35*****	**18.68**	**32.01**		**25.03**	**17.12**	**24.71**	**.45**

* **p < .001; **p < .01

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Study 2: Generalization of *Early Interventions in Reading* (EIR) in Urban & Rural, Low SES contexts

- ERI implemented in 1st-Grade in 20 schools across 2 years.
- Students at-risk for reading difficulties at each school were randomly assigned to receive the research intervention (ERI; *n* = 148) or typical school practice (TP; *n* =159).
- 76% of the TP students received an alternate school-provided intervention.
- Students in the ERI group had significantly higher outcomes than those in the TP group on multiple measures of reading.
- Over 90% of ERI students met word reading criteria for adequate intervention response, but fewer met a fluency benchmark.

EIR End of Year Observed Score Means and Standard deviations, and Effect Sizes

	EIR			*Typical*		
Measure	***M***	***SE***		***M***	***SE***	***Effect***
CTOPP Blending Words	**14.20**	**.47**		**12.53**	**.46**	**.49***
CTOPP Blending Non-words	**9.47**	**.36**		**8.48**	**.35**	**30***
CTOPP Segmenting Words	**10.41**	**.38**		**8.89**	**.38**	**.44***
IRT Word List	**22.48**	**1.03**		**19.83**	**1.01**	**.25***
TOWRE Sight Word Efficiency	**24.66**	**1.28**		**22.84**	**1.26**	**.17**
TOWRE Phonemic Decoding	**11.25**	**.78**		**9.67**	**.75**	**.24***
WJ-III Letter Word ID (w)	**429.93**	**2.83**		**423.44**	**2.79**	**.28***
WJ-III Word Attack (w)	**473.53**	**2.51**		**468.44**	**2.47**	**.26***
WJ-III Passage Comprehension (w)	**447.12**	**2.05**		**443.03**	**2.02**	**.24***
WJ-III Spelling (w)	**451.71**	**1.79**		**449.41**	**1.76**	**.15**
Oral Reading Fluency	**29.63**	**2.00**		**27.59**	**1.98**	**.11**
Nonsense Reading Fluency	**55.38**	**2.78**		**52.04**	**2.74**	**.26***
Phonemic Segmenting Fluency	**51.83**	**1.45**		**48.28**	**1.42**	**.38***

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* Statistically significant

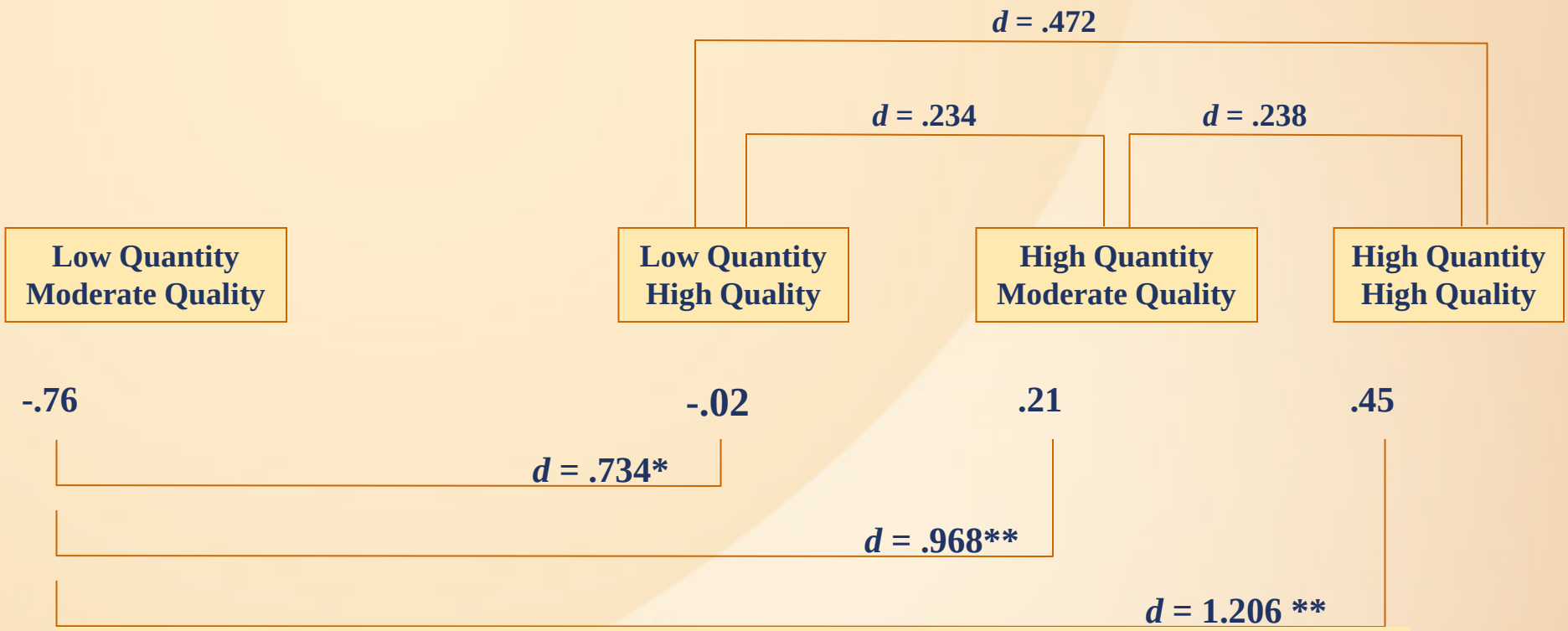
Study 3: Measuring the Impact of Implementation Fidelity on Student Outcomes

Question:

How do *quality* of implementation of the intervention and *quantity* of the intervention delivered impact student outcomes?

- ***quality*** = both the number of components delivered and how well each component was delivered during an instructional session (i.e., the snapshot)
- ***quantity*** = the amount of the intervention delivered across the time period in which the intervention was supposed be implemented (i.e., dosage).

Pairwise Comparisons Between Group Centroids



d = Standardized mean differences were calculated by dividing the difference between group centroids by the square root of the residual (Maxwell & Delaney, 2004). Outcomes based on EIR data only.

* $p < .05$
** $p < .001$

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Factors that Impact Outcomes

1. Quantity of implementation
2. Quality of instruction
3. Quantity has more power than than quality!
4. Both are important!

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Study 4: Context

- What child, teacher, and/or school factors predict student performance levels at the end of the academic year.
  - Student = pretest status & inattentive ADD
  - Teacher = coaching
  - School = assignment of intervention teacher for Tier 2

Phonological Awareness Posttest Factor Score Analyses

	M0: Null		M1: Student		M2: Student+Teacher		M3: Student+Teacher+School	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Fixed effects:								
Intercept	-.012	.062	-.018	.056	-.148	.093	-.359	.115
Student Pre			.561***	.045	.553***	.046	.561***	.046
ADHDIn			.081*	.038	.085*	.038	.086*	.038
Int. Teacher (Title 1)					.187	.107	.176	.102
Coaching (Virtual)							.301*	.128
Coaching (On Site)							.335*	.127
Random effects:								
Residual (σ^2_e)	.606	.049	.389	.033	.387	.033	.394	.034
Intercept ($\sigma^2_{\mu 0}$)	.105	.039	.096	.033	.093	.032	.067	.028
Fit:								
χ^2	861.691		675.434		671.235		655.525	
AIC	867.691		685.434		683.235		671.525	
BIC	879.282		704.460		706.048		701.796	

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Word Reading Posttest Factor Score Analyses

	M0: Null		M1: Student		M2: Student+Teacher		M3: Student+Teacher+School	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Fixed effects:								
Intercept	.002	.066	-.007	.048	-.149	.083	-.104	.108
Student Pre			.526***	.046	.519***	.046	.518***	.049
ADHDIn			.280***	.039	.282**	.040	.286***	.040
Int. Teacher (Title 1)					.204*	.098	.211*	.098
Coaching (Virtual)							-.122	.120
Coaching (On Site)							-.023	.118
Random effects:								
Residual (σ^2_e)	.716	.059	.434	.036	.431	.036		
Intercept ($\sigma^2_{\mu 0}$)	.110	.046	.047	.024	.044	.022		
Fit:								
χ^2	917.297		691.752		686.321		677.771	
AIC	923.297		701.752		698.321		693.771	
BIC	934.888		720.777		721.133		724.042	

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Passage Comprehension Posttest Score Analyses

	M0: Null		M1: Student		M2: Student+Teacher		M3: Student+Teacher+School	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Fixed effects:								
Intercept	.002	.079	-.005	.069	-.001	.061	-.447	.216
Student Pre			.229***	.047	.225***	.047	.224***	.047
ADHDIn			.360***	.047	.369***	.047	.376***	.047
Teacher Fidelity					.206***	.055	.154**	.055
Intervention(Responsive)							.319*	.119
Coaching (Virtual)							-.043	.139
Coaching (On Site)							-.118	.135
Random effects:								
Residual (σ^2_e)	.811	.066	.638	.054	.642	.055	.652	.056
Intercept ($\sigma^2_{\mu 0}$)	.191	.064	.139	.050	.080	.040	.045	.034
Fit:								
χ^2	972.874		836.605		824.683		804.210	
AIC	978.874		846.605		836.683		822.210	

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Spelling Posttest Score Analyses

	M0: Null		M1: Student		M2: Student+Teacher		M3: Student+Teacher+School	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Fixed effects:								
Intercept	.013	.079	.004	.061	.006	.056	.051	.100
Student Pre			.361***	.046	.353***	.046	.326***	.048
ADHDIn			.333***	.046	.339***	.046	.334***	.046
Teacher Fidelity					.164**	.052	.139**	.052
Coaching (Virtual)							-.041	.138
Coaching (On Site)							-.088	.136
School Pre							.279*	.134
Random effects:								
Residual (σ^2_e)	.814	.067	.567	.048	.564	.048	.550	.047
Intercept ($\sigma^2_{\mu 0}$)	.198	.068	.095	.041	.068	.034	.061	.031
Fit:								
χ^2	975.294		789.993		780.467		756.822	
AIC	981.294		799.993		792.467		774.822	

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The Big Ideas

Value of Coaching

- Coaching facilitated Quality of Implementation.

Importance of Leadership

- School and district leaders facilitate or create barriers for Quantity of Implementation.
  - Support (or not) for role of intervention teacher
  - Ensuring time (or not) for Tier 2 intervention

Teacher Support

- Staff Development is not enough.
- High teach mobility results in needs for ongoing support for teachers who are new implementers
- Even highly expert teachers are faced with challenges.
- All teachers need ongoing support.

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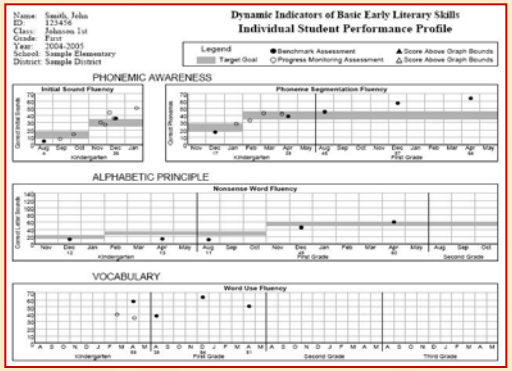
Teacher mobility over is a huge obstacle!

2004-05 = 45 teachers
2005-06 = 19 returning teachers (58% loss)
2006-07 = 8 returning teachers (83% total loss)
2007-08 = 4 returning teachers (92% total loss)

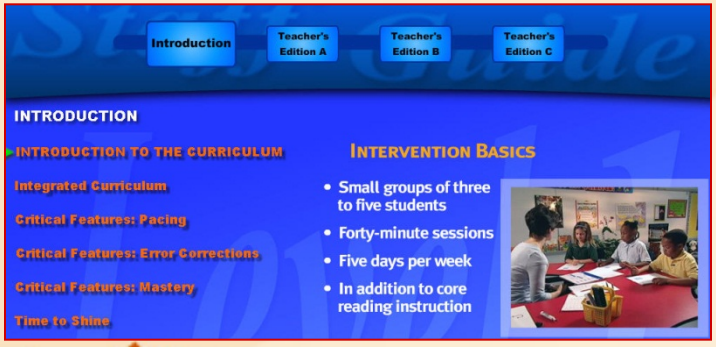
Virtual Coaching

Data-Based and Student focused

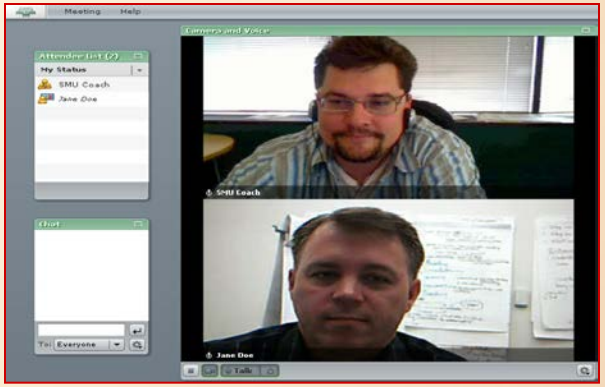


Classroom Observations

Teacher Resources



Communications



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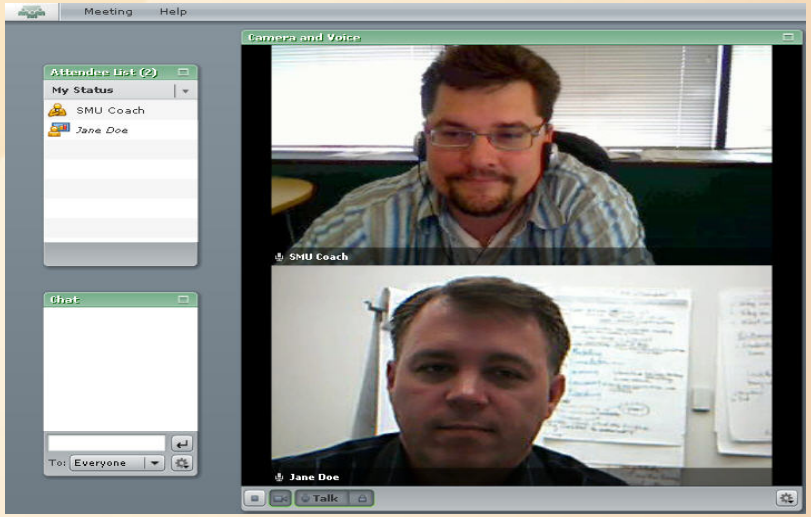
Communications

- Coaches facilitate communication in multiple ways
  - My coach (one-on-one discussions)
  - My team (group discussions)
  - Teleconferencing/ videoconferencing (personal coaching)



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Leadership

- School leadership has to support the instructional model.
  - Protecting time.
  - Building infrastructure

Infrastructure

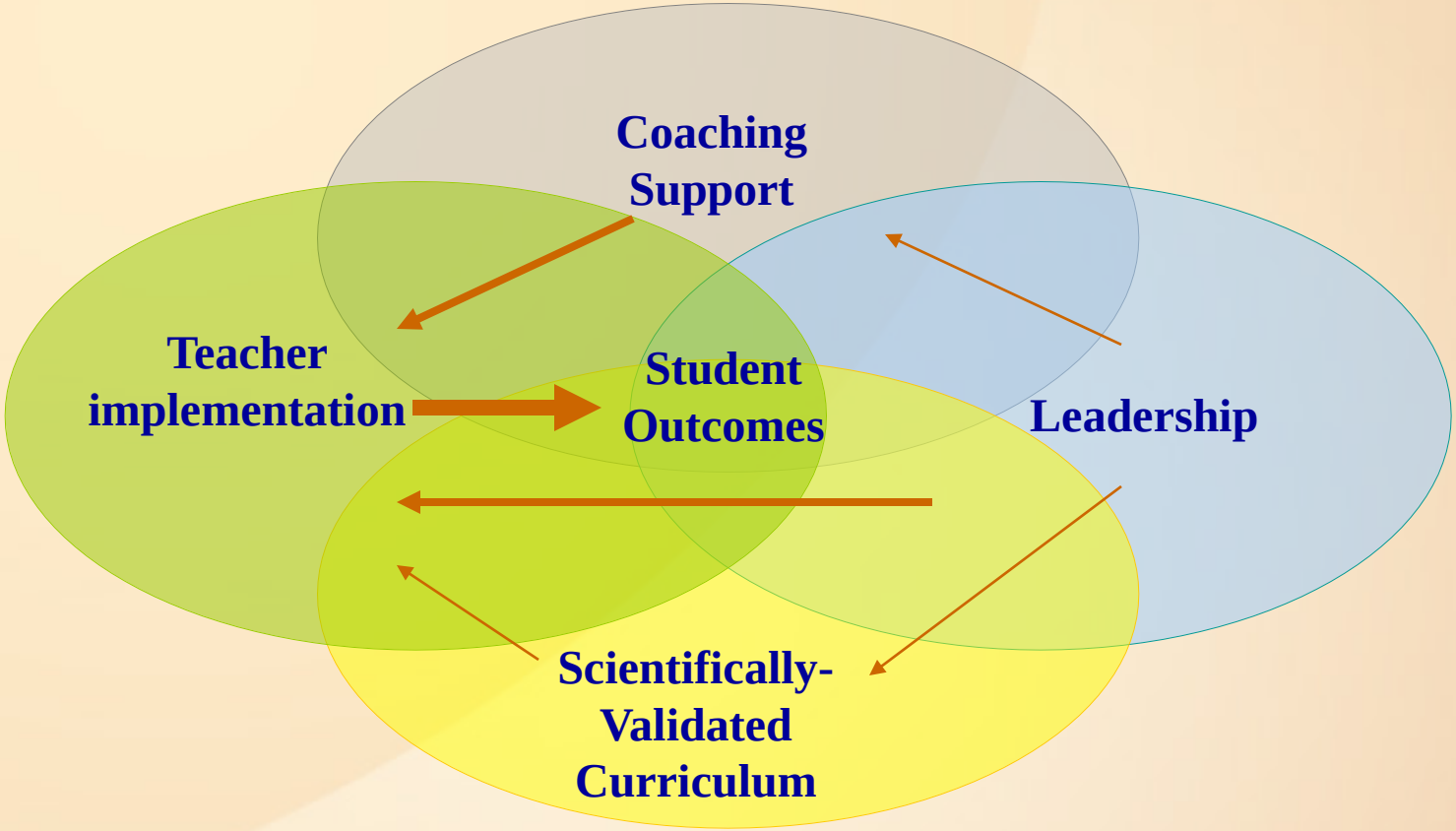
Effective Model

- Intervention teacher(s) provides small group in addition to core through-out the day.
- Special education, Title1, and general education work together seamlessly.

Ineffective Model

- General education teacher provides both core and Tier 2 intervention.
- Special services don't become involved until Tier 3.

Critical Components for Positive Student Outcomes



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