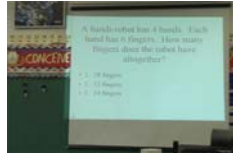


## Student Response Systems, Whole Class Engagement, & Learning



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## Pilot Study

- Can the use of technologies designed to support group participation in classroom activities increase whole class engagement?
- 22 students in a third grade class from a suburban elementary school in northeast Ohio



Phase I; baseline

Phase II; document camera

Phase III; wireless writing pads

Phase IV; student response system



## Data Sources

two sources of quantitative assessment of student engagement in each lesson based on four of Schlechty's (2001) five levels of engagement – authentic engagement, ritual compliance, passive compliance and retreatism

- students' individual assessments of their engagement in each lesson (359 forms/18 lessons)
- researchers' assessments of general whole class engagement recorded for each five minute interval of each lesson (108 observations/18 lessons)



## Data Analysis

Data from both data sets were compared using analysis of variance with lesson as the unit of analysis to test for significant differences in student engagement across conditions.

The Tukey HSD post hoc test was used to further explore significant differences found.



## Results: Engagement Ratings

	observer ratings		student ratings	
	M	(SD)	M	(SD)
baseline	1.67	(.610)	1.94	(.354)
document camera	1.60	(.093)	2.26	(.193)
writing pads	1.71	(.158)	2.30	(.326)
<b>response system</b>	<b>2.67</b>	<b>(.471)</b>	<b>2.81</b>	<b>(.166)</b>

0=Retreatism, 1=Passive Compliance, 2=Ritual Compliance, 3=Authentic Engagement



### Post-Hoc Comparisons of Observer Ratings

		mean dif.	sig.
baseline	document camera	.064	.994
	writing pads	-.042	.999
	student response	-1.002	.011
document camera	baseline	-.064	.994
	writing pads	-.106	.979
	student response	-1.066	.007
writing pads	baseline	.042	.999
	document camera	.106	.979
	student response	-.660	.021
student response	baseline	1.002	.011
	system document camera	1.066	.007
	writing pads	.960	.021

sig difs (p<.05) between lessons in which SRS was used and all others

### Post-Hoc Comparisons of Student Ratings

		mean dif.	sig.
baseline	document camera	-.320	.294
	writing pads	-.354	.262
	student response	-.864	.002
document camera	baseline	.320	.294
	writing pads	-.034	.998
	student response	-.544	.045
writing pads	baseline	.354	.262
	document camera	.034	.998
	student response	-.510	.082
student response	baseline	.864	.002
	system document camera	.544	.045
	writing pads	.510	.082

sig difs (p<.05) between lessons in which the student response system was used and all but those using writing pads and they approached sig

### Ongoing SRS Study

- Can the use of student response systems increase whole class engagement?
- Can the use of student response systems improve student learning from whole class presentations?
- 24 third grade students, 39 fourth grade students (two classes), 36 seventh grade students (two classes) & 18 eighth grade students from 6 intact classes visiting RCET's AT&T classroom
- randomly assigned to view similar Powerpoint presentations on Kent State that either employed or did not employ SRS – all presentations were given by the same RCET staff member

### Data Sources

- students' individual assessments of their engagement in each lesson
- researchers' assessments of general whole class engagement recorded for each two minute interval of each lesson
- 10 item post-test on topics covered in the presentation; 5 questions similar to embedded questions

### Data Analysis

Data from each data set were aggregated across classes and compared between groups (SRS/control) using 3 way ANOVA (to explore potential differences related to grade level and sex).

### Results: Engagement Ratings

Grade level	SRS Condition		No SRS Condition	
	Observer ratings M (SD)	Student ratings M (SD)	Observer ratings M (SD)	student ratings M (SD)
3	3.83 (0.388)	3.72 (0.647)	3.25 (0.683)	3.85 (0.376)
4	3.76 (0.431)	3.76 (0.539)	3.19 (0.402)	3.16 (0.765)
7	3.68 (0.474)	3.00 (0.594)	3.18 (0.476)	2.83 (0.707)
8	3.67 (0.485)	3.33 (0.707)	3.18 (0.393)	3.10 (0.568)
Total	<b>3.73</b> (0.445)	<b>3.46</b> (0.678)	<b>3.20</b> (0.474)	<b>3.20</b> (0.732)

sig difs in observer ratings (p<.01) between groups (but not classes or sexes) and in student ratings between groups and classes (p<.01 level), students in lower grades rated themselves more engaged; no sig dif between sexes, and no sig interactions in either comparison

### Results: Post-Test Scores

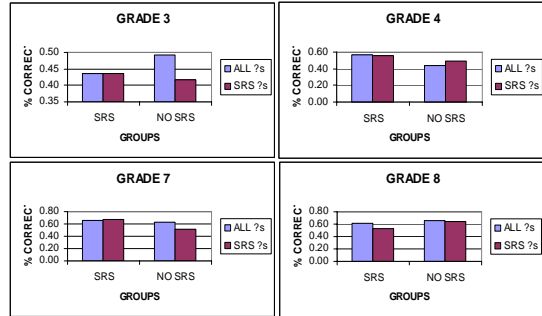
Grade level	SRS Condition		No SRS Condition	
	Whole test* M (SD)	SRS ?s** M (SD)	Whole test* M (SD)	SRS ?s** M (SD)
3	4.36 (1.859)	2.64 (1.362)	4.92 (1.935)	2.69 (1.437)
4	6.00 (1.747)	3.80 (1.196)	5.63 (2.087)	3.58 (1.502)
7	6.39 (1.577)	4.39 (1.420)	6.03 (1.383)	4.11 (1.231)
8	6.13 (0.641)	3.63 (0.916)	6.60 (1.265)	4.60 (0.843)
Total	5.96 (1.742)	2.69 (0.744)	5.87 (1.855)	3.72 (1.439)

\*Whole test scores are on a scale of 0-10; \*\*SRS scores are on a scale of 0-5

no sig difs between groups overall on either whole test or questions similar to embedded questions; at two grade levels, students in the SRS condition outperformed those in the control condition, at two grade levels students in the no SRS condition outperformed those in the experimental condition; students in higher grades outperformed students in lower grades



### Comparisons by Grade (% correct)



### Summary of Findings

- use of Student Response Systems increases student engagement in whole class presentations
- little difference in engagement between grade levels or sexes, and no interaction effects
- BUT increased engagement does not necessarily result in increased performance



### Directions for Future Research

- further investigation of effects of SRS use on learning
- further experiments with presentations focusing topics involving judgment/problem solving
- quasi-experimental study of longer term effects of SRS use on student mathematics and English language arts achievement



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