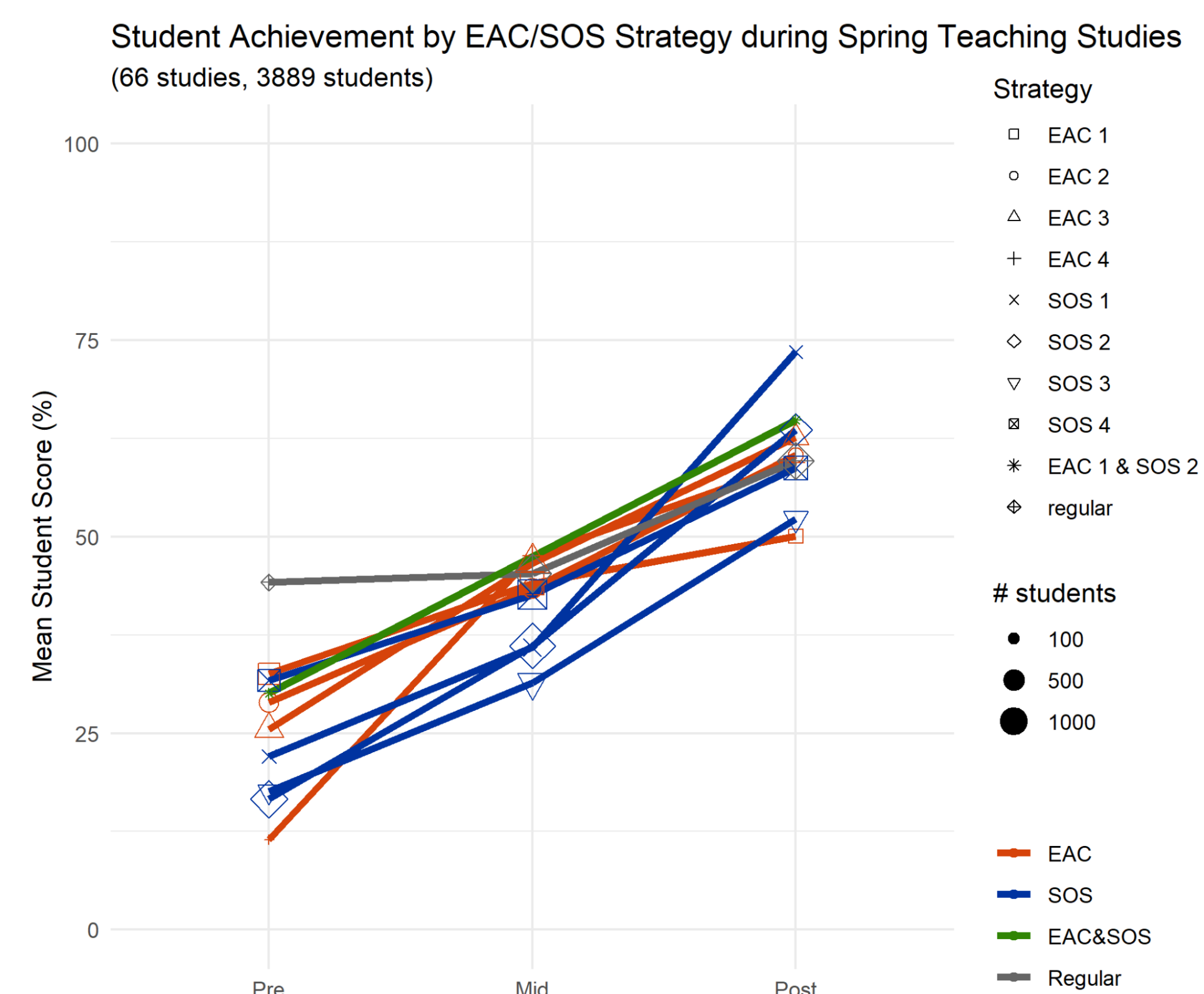
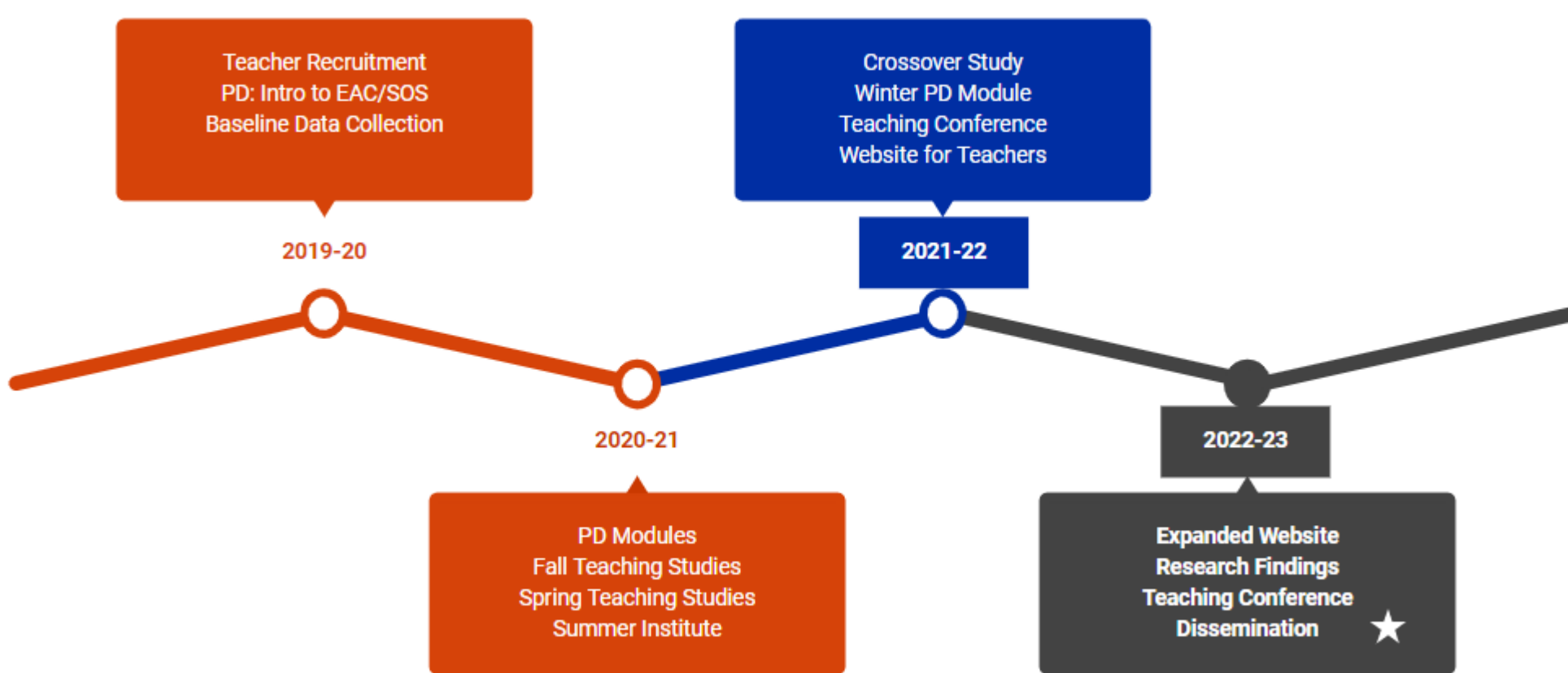


**Improving Grades 6-8 Students' Mathematics Achievement in Modeling and Problem Solving through Effective Sequencing of Instructional Practices**  
NSF DRK-12 #1907840



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**Purpose:** To articulate effective instructional practices in grades 6-8 mathematics while studying effects on student achievement.



# Sequencing instruction for middle grades math achievement.

## EAC

focus on concepts
make concepts explicit and public
emphasize connections

Encourage multiple ways to represent concepts and procedures

Use visuals to help press connections

Talk about why, not just how and what

Start or end by synthesizing the main concepts

How many red buckets should be mixed with 45 blue buckets?

## SOS

focus on sense-making
apply sustained mental effort
engage with important math

Engage students in rich tasks, with multiple paths

Challenge students to keep trying

Question students to help them make progress

Ask students to explain their thinking

Which is better, one-sixth of a medium pizza, or one-eighth of a large?

$(1/6) * (\pi) * (14/2)^2 \approx 25.66$

$(1/8) * (\pi) * (16/2)^2 \approx 25.13$

**“Struggle First” vs. “Concepts First”**

We conducted a one-year randomized crossover trial to compare ways to sequence EAC and SOS instructional practices.

Findings expected in Spring 2024.

## Modeling and Data Analysis Literacy

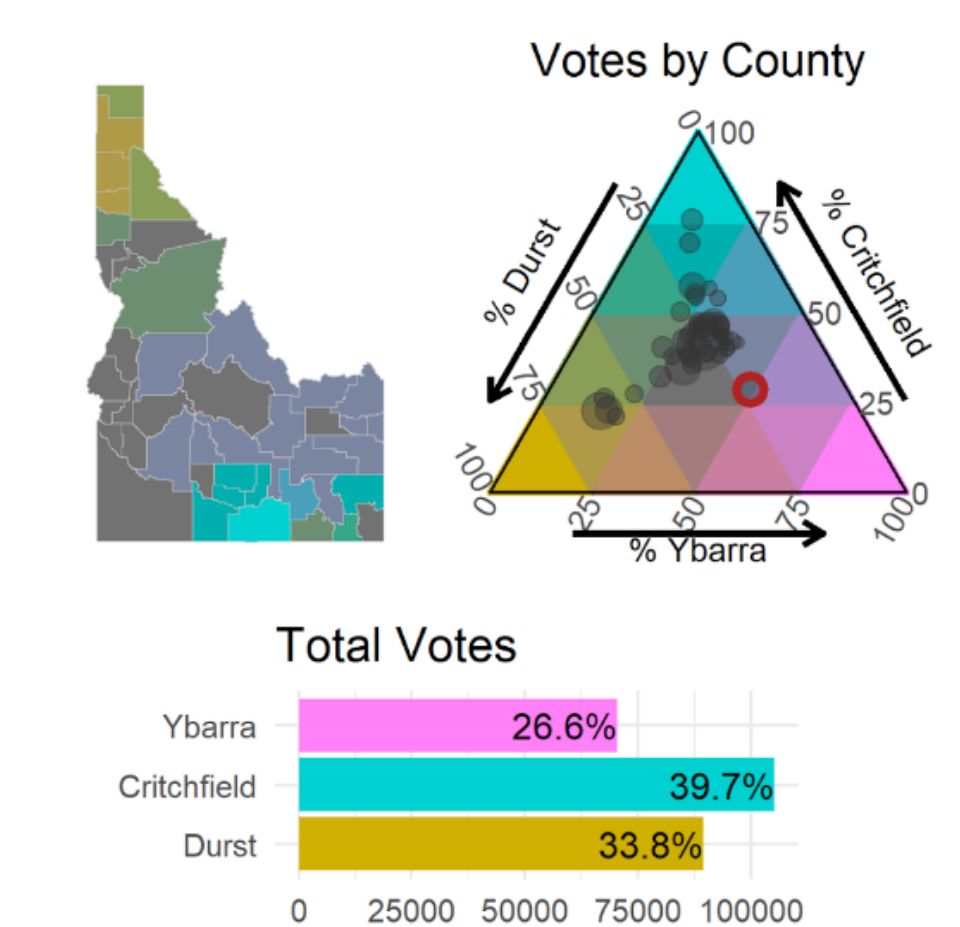
We received supplemental funding to conduct classroom studies of EAC and SOS for data science content during 2023-24.

### Example Task

The charts and table show results of a statewide primary election (see [bit.ly/idprimary2022](http://bit.ly/idprimary2022) for details). Make sense of the provided details, and answer the following:

- Who won the election?
- How many total votes were cast for each candidate?
- In which part(s) of the state did the winner get the most votes?
- What do the colors in the map show? What does gray mean?
- Interpret the meaning of the gray dot inside the red circle?

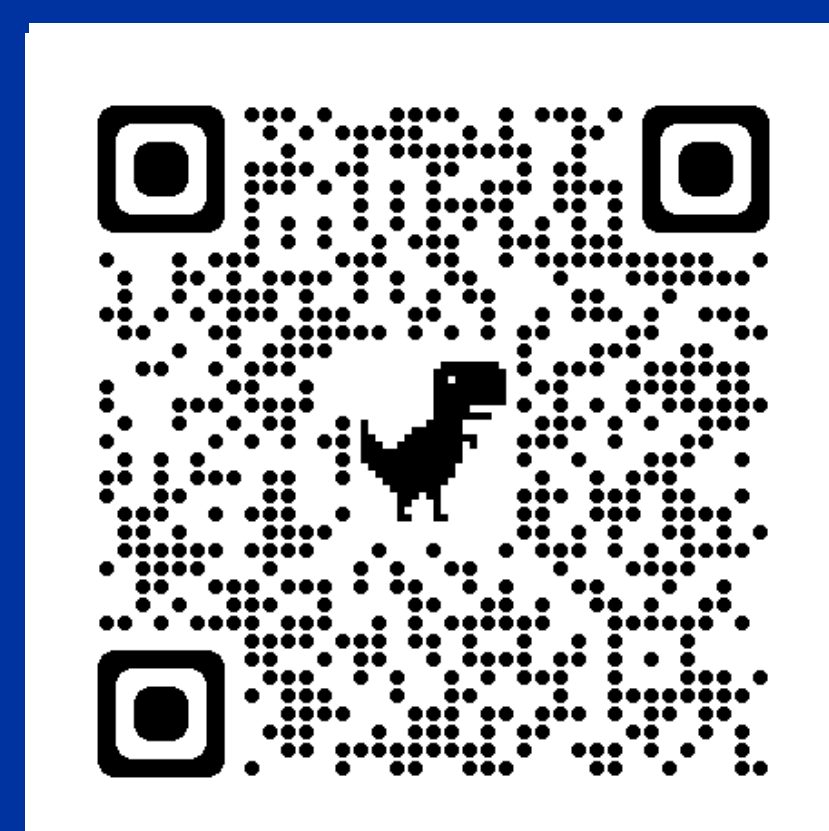
Idaho Primary Election Results, May 2022  
Superintendent of Public Instruction (Republicans)



	A	B	C	D
1 County	Durst	Critchfield	Ybarra	
2 Ada	20522	28360	21947	
3 Adams	243	358	338	
4 Bannock	2153	4488	2865	
5 Bear Lake	386	666	380	
6 Benewah	869	315	289	
7 Bingham	1548	3270	2177	
8 Blaine	498	850	779	
9 Boise	630	661	576	
10 Bonner	6648	2550	1889	
11 Bonneville	4101	7566	4883	
12 Boundary	1765	781	434	
13 Butte	121	235	184	
14 Camas	77	155	125	
15 Canyon	9471	9059	7627	
16 Caribou	323	750	306	
17 Cassia	588	3267	473	
18 Clark	35	75	70	
19 Clearwater	481	578	417	
20 Custer	336	460	392	
21 Elmore	815	1000	1694	

(... = 24 more rows, see [bit.ly/idprimary2022](http://bit.ly/idprimary2022))

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