CADRE INVESTIGATION

DR K-12 English Language Learner Projects and Their Contribution to the Field

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CADRE PI MEETING

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Community for Advancing Discovery Research in Education

CADRE

Session Overview

Explore the role of funding programs in shaping research agendas through deliberate and targeted funding for priority areas

- Case of ELL projects in DR K-12
- Discussion of results
- Implications for future research and policy

Key Events in Development of Case

- DR K-12 PI meeting 2009
- ELL advisory group call 2010
- AERA round table 2011

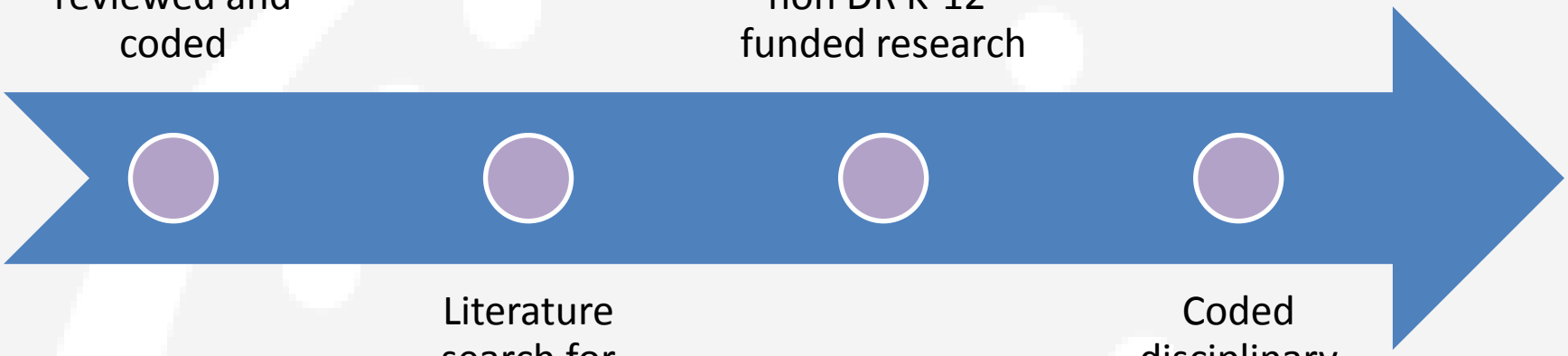
Context

- Of the 295 DR K–12 projects funded between 2007 and 2011 (cohorts 1–5), 34 projects (12%) focused on developing resources, models, or tools for ELLs
- Of these 34 projects, 15 focused on science, 16 on math, and 3 on both science and math
- The DR K-12 funded two additional cohorts in 2012 and 2013 (cohorts 6-7). These were not included in this review because they had not been funded at the time of the analysis

Research Questions

1. What are the characteristics of non DR K-12-funded ELL research studies and those of the DR K–12 portfolio of ELL education projects?
    a. Science education
    b. Math education
2. What is the disciplinary expertise of the investigators (PIs and co-PIs) working on the DR K–12 ELL science and mathematics projects?

Approach



Areas Investigated

- Research topics
- Research methods and design
- Student outcomes
- Researcher expertise

Your Own NSF Project

Think about your own NSF project with regard to the following areas:

- Research topics
- Design/methods
- Outcomes
- Researcher expertise

Research Topics

Research Topic	ELL Science Education	ELL Math Education	Science Education	Math Education
Learning				
Curriculum				
Instruction				
Assessment				
Teacher preparation (preservice)				

Research Topics

Research Topic	ELL Science Education			ELL Math Education	
	Field 1982 to 2004[a] (*n*=34)	Field 2005 to March 2013 (*n*=44)	DR K–12 Projects (*n*=18)[b]	Field Since 1982 (*n*=45)	DR K–12 Projects (*n*=19)
Learning	Emerging	43%	11%	42%	5%
Curriculum	Limited	25%	44%	13%	16%
Instruction	Emerging	45%	61%	29%	89%
Assessment	Limited	18%	11%	29%	16%
Teacher preparation (preservice)	None	5%	22%	0%	21%

Percentages sum to over 100% because projects can address more than one topic area.

[a] As described in Lee (2005).

[b] The three projects that focus on both science and mathematics are included in this total.

Research Methods and Design

	ELL Science Education	ELL Math Education	Science Education	Math Education
Research Methods				
Mixed methods				
Quantitative methods only				
Qualitative methods only				
Research Design				
Experimental design				
Quasi-experimental design				
Descriptive				

Research Methods and Design

	ELL Science Education			ELL Math Education	
	Field 1982 to 2004[a] (*n*=34)	Field 2005 to March 2013 (*n*=44)	DR K–12 Projects (*n*=18)[b]	Field Since 1982 (*n*=45)	DR K–12 Projects (*n*=19)
Research Methods					
Mixed methods	Rare	25%	89%	29%	84%
Quantitative methods only	Rare	39%	6%	47%	0%
Qualitative methods only	Most	36%	6%	24%	16%
Research Design					
Experimental design	Rare	7%	28%	2%	17%
Quasi-experimental design	Rare	36%	17%	38%	22%
Descriptive	Most	61%	56%	69%	61%

Totals do not necessarily sum to 100% due to rounding or to the fact that projects can include multiple research designs or outcomes.

[a] As described in Lee (2005).

[b] The three projects that focus on both science and mathematics are included in this total.

Student Outcomes

	ELL Science Education	ELL Math Education	Science Education	Math Education
Intended Outcomes				
STEM achievement				
English proficiency or literacy				
Student engagement, agency, or empowerment				
Language Consideration				
Linguistic and/or semiotic theories				

Student Outcomes

	ELL Science Education			ELL Math Education	
	Field 1982 to 2004[a] (*n*=34)	Field 2005 to March 2013 (*n*=44)	DR K–12 Projects (*n*=18)[b]	Field Since 1982 (*n*=45)	DR K–12 Projects (*n*=19)
Intended Outcomes					
STEM achievement	Few	57%	78%	71%	74%
English proficiency or literacy	Few	18%	39%	22%	11%
Student engagement, agency, or empowerment	Rare	14%	33%	24%	22%
Language Consideration					
Linguistic and/or semiotic theories	Rare	57%	44%	29%	37%

Totals do not necessarily sum to 100% due to rounding or to the fact that projects can include multiple research designs or outcomes.

[a] As described in Lee (2005).

[b] The three projects that focus on both science and mathematics are included in this total.

Disciplinary Expertise of Investigators

Type of Professional Activity	Science/ Science Education	Math/ Math Education	ELL/ELA
Field of highest degree			
Peer-reviewed articles			
Grants awarded			
Conference papers			
Courses taught			
Overall			

Disciplinary Expertise of Investigators
(80 PIs and Co-PIs)

Type of Professional Activity	N	Science/ Science Education	Math/ Math Education	ELL/ELA
Field of highest degree	77	44%	11%	4%
Peer-reviewed articles	72	50%	29%	24%
Grants awarded	64	39%	36%	20%
Conference papers	59	41%	30%	22%
Courses taught	50	50%	26%	12%
Any type of professional activity	77	53%	39%	19%

Percentages across rows do not necessarily sum to 100% because investigators can have other disciplinary expertise besides the five areas of expertise that were coded or investigators can have expertise in multiple areas.

Contributions of DR K-12 Projects

- **Research topics**
  - Emphasis on instruction and teacher preparation
  - Focus on middle and high school students
- **Research methods and design**
  - Mixed methods, especially quantitative methods
  - larger scale
- **Student outcomes**
  - More focus on student outcomes in science education
- **Researcher expertise**
  - Investigators are making connections across the content and ELL/ELA areas and incorporating expertise from both areas

Limitations of Study

- The study presents a broad analysis of the literature and DR K-12 projects from 2007 to 2011, **but it did not:**
  - Conduct an integrative review or meta-analysis
  - Employ a particular theoretical framing
  - Analyze theoretical or conceptual frameworks of studies
  - Include two additional cohorts of DR K-12 projects in 2012 and 2013 (cohorts 6-7)
- There was no literature review in math education
- The study was not able to provide a comparison of the expertise of DR K–12 investigators with the larger field

Implications for Future Research and Policy

1. At your table, discuss implications for future research and policy for math and science education research with ELLs.
2. Share your group discussion with the whole group.

Discussion Topics

1. What are the implications of the case study for future research on STEM with ELLs?
2. What are the implications of CCSS and NGSS for research on ELLs?
3. What additional research agenda would you recommend (e.g., student diversity broadly)?
4. What is the role of funding programs for priority areas where targeted funding would be particularly helpful and ways in which funding agencies could promote progress in such areas?