# Supplemental Material

***CBE—Life Sciences Education***

**Krim** ***et al.***

CURE papers:

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# Secure_Coding Google Form_Lit Review_April 2017

General Instructions:

Welcome, CARET collaborators!

This Google Form is designed to be used in combination with the "Secure_Written Coding Guide_Lit Review_March 2017" on Google Drive. Open up that document to refer to while coding papers.

*********

FIRST STEP:

Please access the full version of each paper you've been assigned. If you do not have access to one of the papers on your list, send an email to LalehCote@berkeley.edu with the APA citation of the paper you need. She will send you back a PDF version of the paper.

SECOND STEP:

If you begin reading a paper, and you believe: a) that it cannot be coded because it does not describe TRE, URE, or CURE programs, or b) some other reason, please send an email to LalehCote@berkeley.edu with the APA citation of the paper in question. You'll be assigned a different paper.

THIRD STEP:

Please fill out a separate Google Form for each paper you read and code. And, please, please, please, make sure to SUBMIT the form after you've entered in your codes! If an item has multiple codes, use commas to separate but there should be no spaces in between. For anything that you're not entirely sure about while coding, please do make a note about this in the "Notes, questions, comments" item at the end of the Google Form.

If you have previously coded a paper using the spreadsheet, you will need to add in your codes using the new Google Form, as there have been significant changes made between December 2016 and March 2017. You may use the codes from the spreadsheet to remind you of your original responses, but please do use the current codes as defined by this Written Coding Guide.

Yes, it is possible to make changes to codes after a form is submitted, but in order to reduce human error, we are encouraging people not to make changes directly on the "live" coding spreadsheet. Ideally, we

want all coding to be done through the Google Form. You can make edits to your Google Form if you make an error, or want to change a code - this can be done from the email you receive after submitting the form.

Note: This is to reduce the possibility that someone will alter something incorrectly on the spreadsheet. Once we have many papers coded, it will be very challenging to notice if a single change on the spreadsheet has been made.

If there is a paper that we feel will be especially useful to the work of the CARET collaboration (these papers will be given an A-rating on item #23 (Potential for informing CARET evaluation efforts), we may have multiple people code that paper. Or, if you are having a challenging time coding a particular paper, please make a note about this issue on item # 24 (Notes, questions, comments), and we can have an additional person read and code that paper.

The goal is not for everyone to code every paper. The goal is for every useful paper to be coded in a way that's most productive for the CARET collaboration.

Questions? Problems? Contact the Lit Review Working Group, so we can help!

* Required

## Email address *

Your email

## Paper: Enter in the APA citation below

Your answer

## Item 1: Year Published (One code only)

- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

2013

2014

2015

2016

2017

## Item 2: Initials of Coder (One code only)

Your answer

## Item 3: Program Type (Multiple codes allowed)

TRE

URE

CURE

Other:

## Item 4: Study Type (One code only)

1 = Empirical study

2 = Program description only

3 = Theoretical

4 = Review

5 = Instrument development

6 = Program Evaluation

Other:

## Item 5: Study Design (One code only)

0 = Not empirical

1 = One data point (pre only or post only)

2 = Pre- and Post-measure

3 = Trajectory; retrospective; multiple data points over time

4 = Comp. of 2(+) sample conditions (quasi-experimental)

5 = Longitudinal (tracking individuals over time)

Other:

## Item 6: More Than Self Report? (One code only)

Yes

No

## Item 7: Study Methods (Multiple codes allowed)

1 = Institutional Data/extrinsic measures survey

2a = Quantitative Self report survey (participants)

2b = Qualitative Self report survey (participants)

3a = Quantitative Self report survey (faculty/mentor)

3b = Qualitative Self report survey (faculty/mentor)

4 = Interviews/focus groups

5 = Content/practice assessment

Other:

## Item 8A: Learning Theory (Multiple codes allowed)

0 = No explicitly stated framework

1 = Constructivist

2 = Transmission

3 = Sociocultural

4 = Cognitive Apprenticeship (includes Community of Practice, Situated Practice)

5 = Transformational

Other:

## Item 8B: Conceptual Framework (One code only)

Your answer

## Item 8C: Theoretical Framework (One code only)

Your answer

## Item 9: Program Design Features (Multiple codes allowed)

0 = No program design features described

1 = Mentor engagement (or “engaged mentoring”), including Interaction with faculty/researcher; Interaction with post-doc/grad student/UG; Mentor training; Regular/scheduled mentor-mentee meetings; Mentor-mentee “contract” for setting expectations

2 = Project Ownership: Student-generated hypothesis/research question

3 = Project Ownership: Student-generated experimental design

4 = Community activity, including Regular research group meetings (peers and/or lab group); Regular seminar or brown bag; Attend conference/symposium; Collaboration on research with peers

5 = Reflection/Metacognition, including NOS reflection

6 = Scientific communication, including Presented a poster or talk; Wrote a summary paper; Contributed to peer-reviewed publication

7 = K-12 Classroom Curricula and Practices, including Curriculum Development; Translate to teaching practice reflection

Other:

## Item 10: TRE, URE, CURE Research Participants (Multiple codes allowed)

0 = Undergrad, not stated

1 = Community College/Technical College Students

2 = Lower Division Undergrads (4-Year Univ)

3 = Upper Division Undergrads (4-Year Univ)

4 = Both Lower & Upper Undergrads (4-Year Univ)

5 = Teacher candidates

6 = In-service Teachers

7 = Grad Students/Postdocs

8 = Higher Education Faculty

Other:

## Item 11: Institutional Research Environment (Multiple codes allowed)

0 = 4 Year University - not stated

1 = 4 Year University - PhD granting

2 = 4 Year University or College - Undergrad-focused

3 = HBCU/HSI/Tribal College

4 = Community College/Technical College

5 = National Lab

6 = Non-Profit Research Org

7 = Industry

Other:

## Item 12: Duration Participants Conduct Research (One code only)

0 = Unclear

1 = < 1 term

2 = 1 term (e.g., full semester, full summer)

3 = 1 year or 2 terms

4 = > 1 year

Other:

## Item 13: Intensity (One code only)

0 = Not stated

1 = Low intensity (< 10 hrs/week)

2 = High intensity (10+ hrs/week)

3 = Both low and high intensity (mixed)

Other:

## Item 14: Research Timing (One code only)

0 = Not stated

1 = Summer

2 = Academic year

3 = Both

Other:

## Item 15: Participants (N) (One code only)

Your answer

## Item 16: Study Subjects - Who were data collected from? (Multiple codes allowed)

0 = Undergrad, not stated

1 = Community College/Technical College Students

2 = Lower Division Undergrads (4-Year Univ)

3 = Upper Division Undergrads (4-Year Univ)

4 = Both Lower & Upper Undergrads (4-Year Univ)

5 = Teacher candidates

6 = In-service Teachers

7 = Grad Students/Postdocs

8 = Higher Education Faculty

Other:

## Item 17: Study Demographics (One code only)

1 = Study focused specifically on Underrepresented Groups

2 = Study includes analysis of larger group (and identifies # of underrepresented group)

3 = Underrepresented Groups not described in analysis

## Item 18: Reported Outcome Measure/s (Multiple codes allowed)

0 = Not stated

1 = Performance (e.g., course grade, GPA)

2 = Disciplinary Content knowledge

3 = NOS

4 = Persistence in STEM pathways

5 = Science practices

6 = Lab Skills

7 = 21st Century skills

8 = Self-efficacy

9 = Confidence

10 = STEM career attitudes & interest (includes education pathways - choices & intentions)

11 = Teacher identity

12 = Scientist identity

13 = Improvement of classroom practice

14 = K-12 student learning outcomes

15 = Perceptions of teachers/teaching profession

16 = Awareness of STEM careers

17 = Leadership

Other:

## Item 19: Primary/Significant Reported Outcome Measure (One code only)

0 = Not stated

1 = Performance (e.g., course grade, GPA)

2 = Disciplinary Content knowledge

3 = NOS

4 = Persistence in STEM pathways

5 = Science practices

6 = Lab Skills

7 = 21st Century skills

8 = Self-efficacy

9 = Confidence

10 = STEM career attitudes & interest (includes education pathways - choices & intentions)

11 = Teacher identity

12 = Scientist identity

13 = Improvement of classroom practice

14 = K-12 student learning outcomes

15 = Perceptions of teachers/teaching profession

16 = Awareness of STEM careers

17 = Leadership

Other:

## Item 20: Content Area (Multiple codes allowed)

1 = Life Science

2 = Physical Science

3 = Earth/Space Science

4 = Engineering

5 = Mathematics

6 = Computer Science

7 = Interdisciplinary STEM fields

Other:

## Item 21: Summary of Findings - Please describe the main findings that you felt were most important from this paper, and feel free to connect these findings to a certain type of program or group. (One code in paragraph format)

Your answer

## Item 22: Implications - How might the findings of this study be used in practice, in a TRE, URE, or CURE? Or, what changes does this paper suggest be made in the future, and why? (One code in paragraph format)

Your answer

## Item 23: Potential for informing CARET evaluation efforts (One code only)

A = High

B = Medium

C = Low

D = No potential

Item 24: Notes, questions, comments - Add in any notes or comments that you would want the CARET group to be aware of, any questions you had when reading the paper, and comment on your reasons for giving the paper a particular score in the last item, “Potential for informing CARET evaluation efforts”. (One code in paragraph format)

Your answer

Item 25: Date coding was completed (One code only)

Date

Feedback about this Google Form or our Literature Review efforts

Your answer

A copy of your responses will be emailed to the address you provided.