

Students:

In-service grades 6 to 12 mathematics teachers.

Student Success:

- (1) Learn in digitally mediated environments.
- (2) Build mathematical content knowledge.
- (3) Build math pedagogical content knowledge.
- (4) Build pedagogical knowledge for interculturally competent teaching.

Evidence of Success:

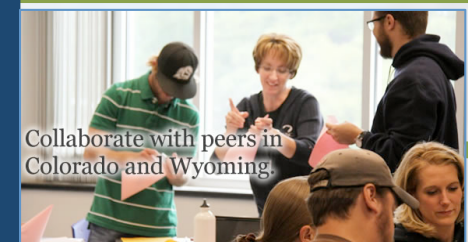
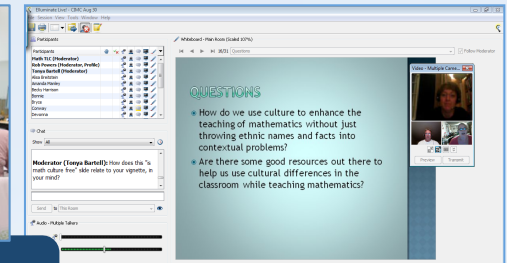
- Grades in face-to-face, hybrid, and distance courses;
- Performance on annual tests of mathematical knowledge & pedagogical content knowledge (PCK);
- Responses to technology surveys;
- Responses to pre/post Intercultural Development Inventory.

Roles of STEM & Education Faculty:

- Scaffold course development and project professional growth about disciplinary discourse and values (e.g., proof in math, formative assessment in education).
- Model being effective with technology as a teacher/seminar leader.
- Explicitly model & discuss PCK and how it impacts classroom interactions.
- Guide Action Research master's theses.

Roles of K-12 District Personnel:

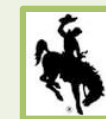
- Professional environment support for each teacher (e.g., computer access at school).
- Opportunities for teachers to share what they learn in buildings/district PD sessions.
- Work with research team on data transfer.
- Identify candidates for MathTLC programs.



Mathematics Teacher Leadership Center MathTLC

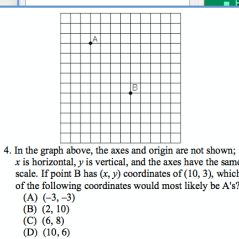
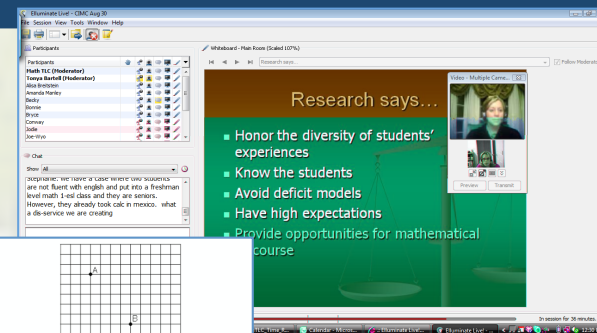


University of Northern Colorado



University of Wyoming

Research
on student achievement and perceptions informs course design and future research design and analysis.



4. In the graph above, the axes and origin are not shown; x is horizontal, y is vertical, and the axes have the same scale. If point B has (x, y) coordinates of $(10, 3)$, which of the following coordinates would most likely be A's?

(A) $(-3, -3)$
(B) $(2, 10)$
(C) $(6, 8)$
(D) $(10, 6)$

6. Mrs. Ramos posed the following question to her students:

If 7 different points on a circle are selected, what is the number of quadrilaterals that have 4 of these points as vertices?

Consider the following student responses, and then answer the questions below:

Team A drew a circle with 7 points along its circumference. They then drew several inscribed quadrilaterals and stated that the answer was 12.

Team B claimed that there were 7 ways to choose the first vertex, leaving 6 points to choose from for the second vertex, and so on. Their answer was $(7 \times 6 \times 5 \times 4)$.

Team C drew a circle and labeled 7 points on the circle, A through G. They then listed 35 different quadrilaterals whose vertices were points on the circle (ABCD, ABCE, etc.) and stated that order of the vertices did not matter.

Team D said that there were 7 vertices from which to choose 4, so the answer is $7C4$ or $\frac{7!}{4!3!}$.

Which of the Team responses do you believe to be the "best" response?

Please explain why you chose the response you did.

In the space below, describe why you rejected each of the other three Team responses.

- Strongly Disagree
- Disagree
- Neutral
- Agree

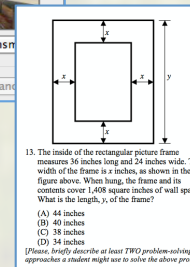
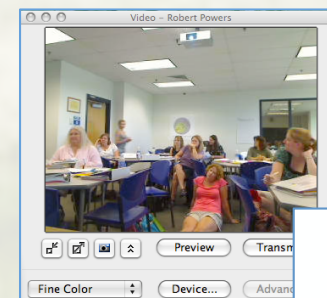
Challenges related to student success:

- + How to scaffold the linking of math, culture, & teaching? How do we deeply engage students and staff in materials to support them in understanding math, culture, and teaching and how to implement same for impact on practice?
- + Support for technology literacy growth (also for professors!).
- + Ways to communicate accessibly and effectively about culture.

- + Developing and effectively implementing in coursework a theory of interculturally competent mathematics pedagogical content knowledge.

Questions about student success for the viewer:

- + How much change is reasonable to target?
- + What constellation of professional insights are available to newer teachers versus more experienced teachers (in the areas of content, PCK and ICC)?
- + What are the particular challenges for adult digital immigrants when interacting with digital natives? In what ways does this involve a form of cross-cultural communication?
- + How to offer and refine an interculturally competent view of pedagogical content knowledge for research and instruction?



13. The inside of the rectangular picture frame measures 36 inches long and 24 inches wide. The width of the frame is x inches, as shown in the figure above. When hung, the frame and its contents cover 1,408 square inches of wall space. What is the length, y , of the frame?

(A) 44 inches
(B) 40 inches
(C) 38 inches
(D) 34 inches

[Please, briefly describe at least TWO problem-solving approaches a student might use to solve the above problem.]

This project is supported by a Math Science Partnership Grant from the National Science Foundation DUE 0832026. Any opinions, findings, and conclusions or recommendations are those of the authors and do not necessarily reflect the views of the National Science Foundation.

