WDE — Opportunity Through Education

Wyoming Perkins Innovation & Modernization Project
Secondary Computer Science (CS) Micro-Credential (MC) Pilot
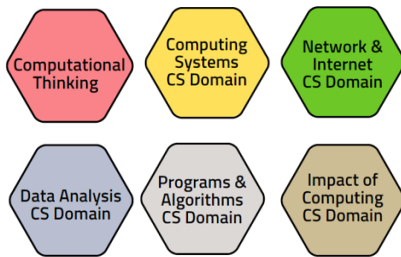
BY THE NUMBERS

IMPACT OF THE MCs

PILOT PARTICIPATION

85 teachers signed up for the project

53 teachers from 21 districts are still enrolled
4 teachers transferred to the Elementary Pilot
28 teachers dropped out

THE MC PROJECT

The MC Project consists of 17 MCs grouped in 6 stacks:

- Computational Thinking
- Computing Systems CS Domain
- Network & Internet CS Domain
- Data Analysis CS Domain
- Programs & Algorithms CS Domain
- Impact of Computing CS Domain

Teachers ("Earners") must earn all 17 MCs in order to be (potentially) endorsed as a CS teacher.

MCs EARNED

26 teachers from 14 districts have earned at least 1 MC

9 teachers earned all 17 MCs
3 teachers earned 10-14 MCs
9 teachers earned 2-6 MCs
5 teachers earned 1 MC

27 teachers from 13 districts have not earned any MCs

2 teachers have 17 MCs in progress
3 teachers have 2-5 MCs in progress
10 teachers have 1 MC in progress
12 teachers have not started any MCs

TIME COMMITMENT

The average time required to complete and earn all 17 MCs is slightly less than a college course.

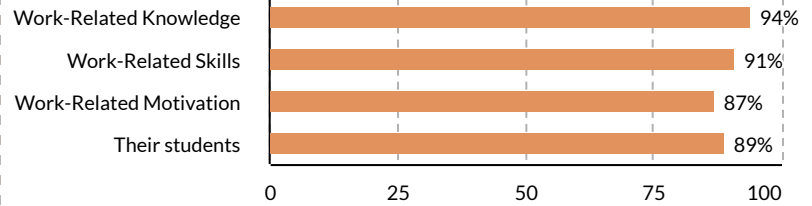**185 hours** across 17 MCs
based on first 9 earners

VS.

225 hours for 15 CS credit hours

END-OF-MC RATINGS

Teachers rate the MCs highly.

Percent of respondents who said the MCs have positively impacted the following:

- Work-Related Knowledge — 94%
- Work-Related Skills — 91%
- Work-Related Motivation — 87%
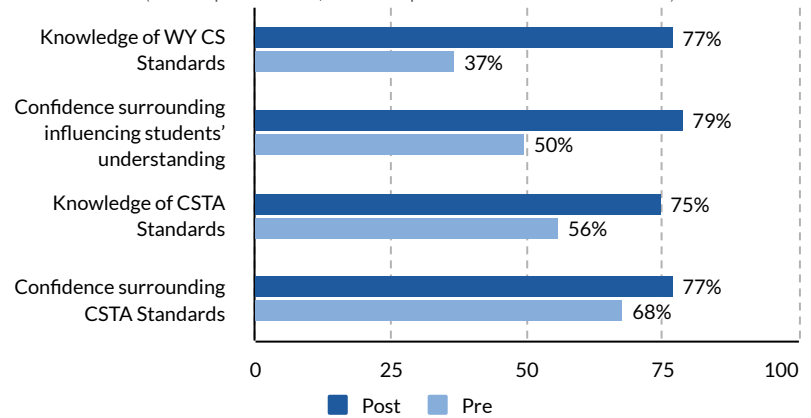- Their students — 89%

(scale 0 to 100)

85% of teachers would recommend the MCs to other teachers.
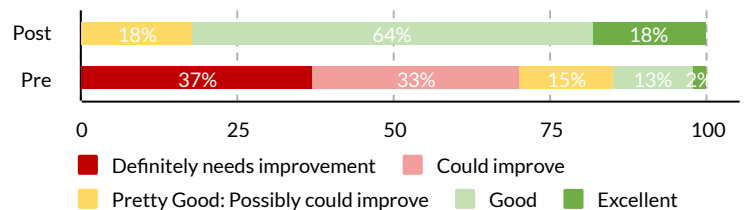
PRE/POST-ASSESSMENT RATINGS

Teachers rate their knowledge and confidence higher after completing the MCs.

Average percent of possible points earned on each scale
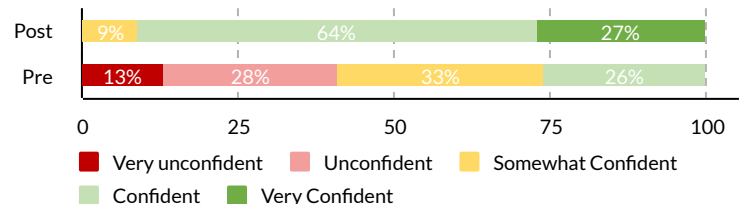(CS=Computer Science; CSTA=Computer Science Teacher Association)

Scale	Post	Pre
Knowledge of WY CS Standards	77%	37%
Confidence surrounding influencing students' understanding	79%	50%
Knowledge of CSTA Standards	75%	56%
Confidence surrounding CSTA Standards	77%	68%

(scale 0 to 100) — ■ Post ■ Pre

Example of pre/post ratings on a WY CS standard

Rating of Teacher Knowledge of CS Standards in Algorithms

	Definitely needs improvement	Could improve	Pretty Good: Possibly could improve	Good	Excellent
Post			18%	64%	18%
Pre	37%	33%	15%	13%	2%

Legend:
- ■ Definitely needs improvement
- ■ Could improve
- ■ Pretty Good: Possibly could improve
- ■ Good
- ■ Excellent

Rating of Teacher Confidence Regarding Influencing Students' Understanding of Algorithms & Programming

	Very unconfident	Unconfident	Somewhat Confident	Confident	Very Confident
Post			9%	64%	27%
Pre	13%	28%	33%	26%	

Legend:
- ■ Very unconfident
- ■ Unconfident
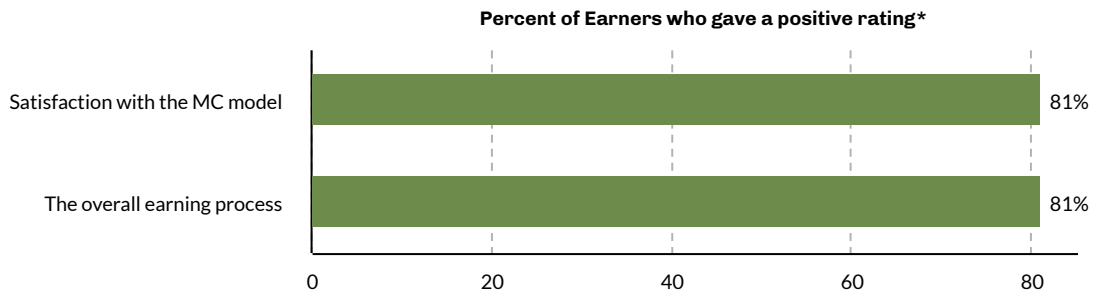- ■ Somewhat Confident
- ■ Confident
- ■ Very Confident

WHAT MAKES MCs UNIQUE?

THE MC MODEL

The rigorous tasks that an Earner completes in order to earn an MC provides teachers with the know-how for teaching CS to secondary students and results in a great sense of accomplishment which impacts the Earner and ultimately their students. Earners and Reviewers complete their work on the MIDAS platform.

Review MC and resources → Complete ADDIE Model → Submit MC → Receive feedback from Reviewers → Make revisions and earn MC → Realize an increase in confidence and motivation → **Positively impact students**

Percent of Earners who gave a positive rating*

Satisfaction with the MC model	81%
The overall earning process	81%

0   20   40   60   80

*Based on 11 Earner interviews in spring 2023.

STRUCTURE

This is not a "sit-and-get" program, but rather, a "show-and-tell" program.

Teachers are required to follow the ADDIE model which is a learning model used by instructional designers to create effective learning experiences. The steps to the ADDIE model, the percent of Earners who rated that step positively, and some typical comments made by the Earners regarding each step are:

1 Analyze (Unpack the WY CS Standard)
98% positivity rating

"I liked that it forced you to dive deep into the standard and pull-out action verbs and concepts that are crucial. It challenged you to think about the vertical alignment. It gave you exposure to the teacher standards and I appreciated they were part of the task."

2 Design/Develop (Complete the Lesson Plan Template)
100% positivity rating

"I appreciate being able to create a lesson and thinking about the formative assessments. I appreciate that they have the universal design guidelines. It helps move our teaching to a deeper level."

3 Implement (Deliver the Lesson and gather student work/artifacts)
95% positivity rating

"I liked that it gave us the opportunity to try it out with students and see if our design worked well with students and allowed us to test out our gauging. Are we going too fast etc.?"

4 Evaluate (Complete the Evaluate worksheet)
98% positivity rating

"I liked that it brought attention to aspects of my instructional delivery or the lessons that were not hitting on the standards that I was supposed to be focusing on. Reflection is always good when teaching. It is something hard to fit in your teaching life, It has forced us to look at student work and where they might be struggling."

Ratings based on End-of-MC Questionnaire and comments based on Earner Interviews.

SCORING PROCESS

The scoring process is rigorous.

Earners are required to score a 3 or 4 (proficient or advanced) on each proficiency scale before they can earn an MC. Each MC has proficiency scales for the WY Computer Science Content & Performance Standards and the Computer Science Teachers Association (CSTA) Standards for CS Teachers. This ensures that teachers have **both** the content and pedagogical knowledge/skills to teach computer science to secondary students.

REITERATIVE PROCESS

An Earner may submit the MC multiple times, each time receiving targeted, constructive feedback on how to show that the Earner has mastered the knowledge and skills of the WY CS Standard.

Of the 223 MCs earned (*as of January 2, 2024*):

41% did not need to be resubmitted with changes
43% had to be resubmitted with changes one time
16% needed to be resubmitted with changes more than one time

REVIEWERS

The scoring process is rigorous. Reviewers go through a calibration process to make sure they provide reliable and valid ratings.

Of the three reviewers, two stated that they are "satisfied" with the reviewer process; one said they are "neutral" about the process.

Example comment: "[The most satisfying aspect of the Reviewer process is] seeing all of the creative ways that teachers around the state are using to teach CS and knowing that I am helping teachers earn their certifications."

WHAT DO EARNERS SAY?

"I am able to have a deeper understanding of the standard and am able to better assist teachers and students learning this standard."

"The Analyze the standards document really helped me to think deeply about the standards. I also appreciated the feedback."

"I feel like I have a solid understanding of how to teach this standard and have gained confidence in the classroom teaching this standard."

"I now understand how the process works and am looking forward to digging into some more microcredentials."

DATA DRIVEN
ENTERPRISES