CONVEYING RESPECT FOR STUDENTS THROUGH THE PRACTICES OF ELICITING AND INTERPRETING STUDENT THINKING

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IMPLICATIONS OF A SHIFT TO PRACTICE-BASED TEACHER EDUCATION

A shift to practice-based teacher education requires:

- Redesigning our coursework for preservice teachers
- Developing new settings for doing the work of teacher education and using current settings differently
- Learning about the skills with teaching practice that preservice teachers bring to teacher education
- Developing ways to assess preservice teachers' developing capabilities

ELICITING STUDENT THINKING: SOME OBSERVATIONS OVER THE YEARS..

After learning that a student has used a "non-standard" (valid) process to solving a problem, preservice teachers sometimes:

- ask questions focused on why the student has "not done" another process → often a "standard" process with which the preservice teacher is more familiar or preferred
- tell a student that they cannot use their (valid) process and that they need to use the "standard" algorithm

INTERPRETING STUDENT THINKING: SOME OBSERVATIONS OVER THE YEARS..

After learning that a student has used a "non-standard" (valid) process to solving a problem, preservice teachers:

- notice attributes of a student's process or their understanding yet they characterize the student's thinking in deficit-focused ways
- make derogatory statements about the student's general mathematical aptitude or skill

RESEARCH QUESTION

How can we capture the ways in which teachers respect (or do not respect) students and their thinking as they engage in the work of eliciting and interpreting student thinking?

- At the beginning of teacher preparation, do preservice teachers enact moves that signal that they are respecting students and their mathematical knowledge?

USING STANDARDIZED SIMULATIONS TO ASSESS TEACHING PRACTICE

Simulations are approximations of practice that can be used for both assessing and supporting ongoing learning

Simulations:

- place authentic, practice-based demands on a participant
- purposefully suspend or standardize some elements of the practice-based situation
- can provide information that are not possible or practical to determine in real-life professional context

OUR TEACHING SIMULATION

The simulation:

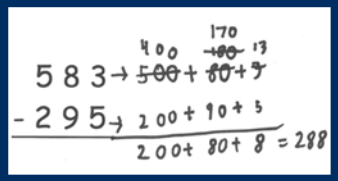
- is designed around a specific piece of student work
- involves a teacher educator taking on the role of a student
- includes a detailed student profile to support standardization of the student
- consists of three parts

USE OF A SIMULATION

Part 1:

Teacher Prepares

The teacher prepares for an interaction with a standardized student about one piece of student work



Part 2:

Simulated Interaction

The teacher interacts with the "student" with the goal of eliciting the student's process and understanding of the process and related mathematical ideas

Part 3:

Interview of the teachers

The teacher interprets the student's thinking in a follow up interview, using evidence from the interaction

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METHODS

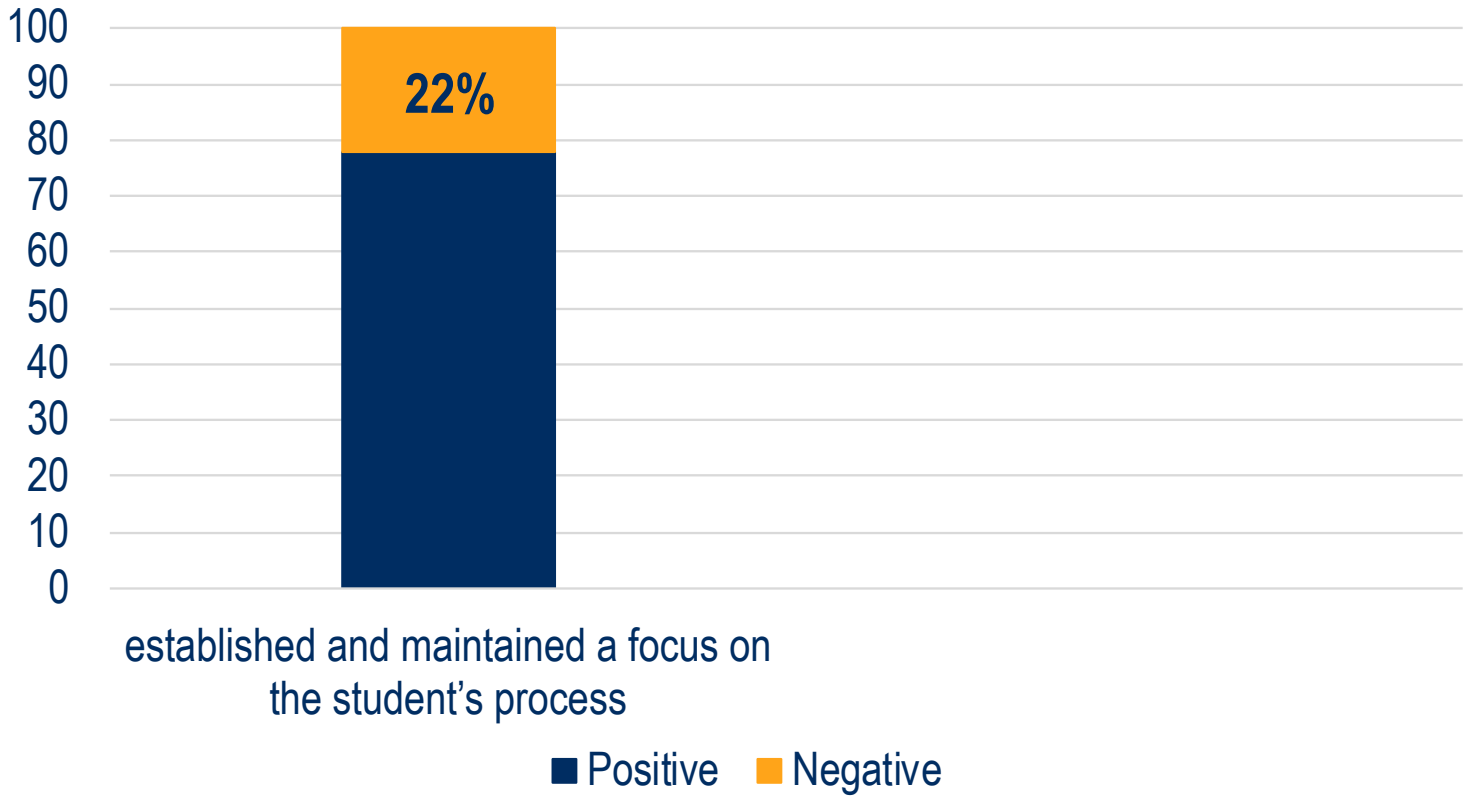
- 32 preservice teachers engaged in the simulation, which was video recorded
- Simulation involved a scenario in which a student:
  - used an alternative algorithm to solve a subtraction problem,
  - arrived at the correct answer, and
  - had robust understanding of the algorithm
- Data collected during the first week of the teacher education program

RESPECTING STUDENTS WHEN ELICITING STUDENT THINKING

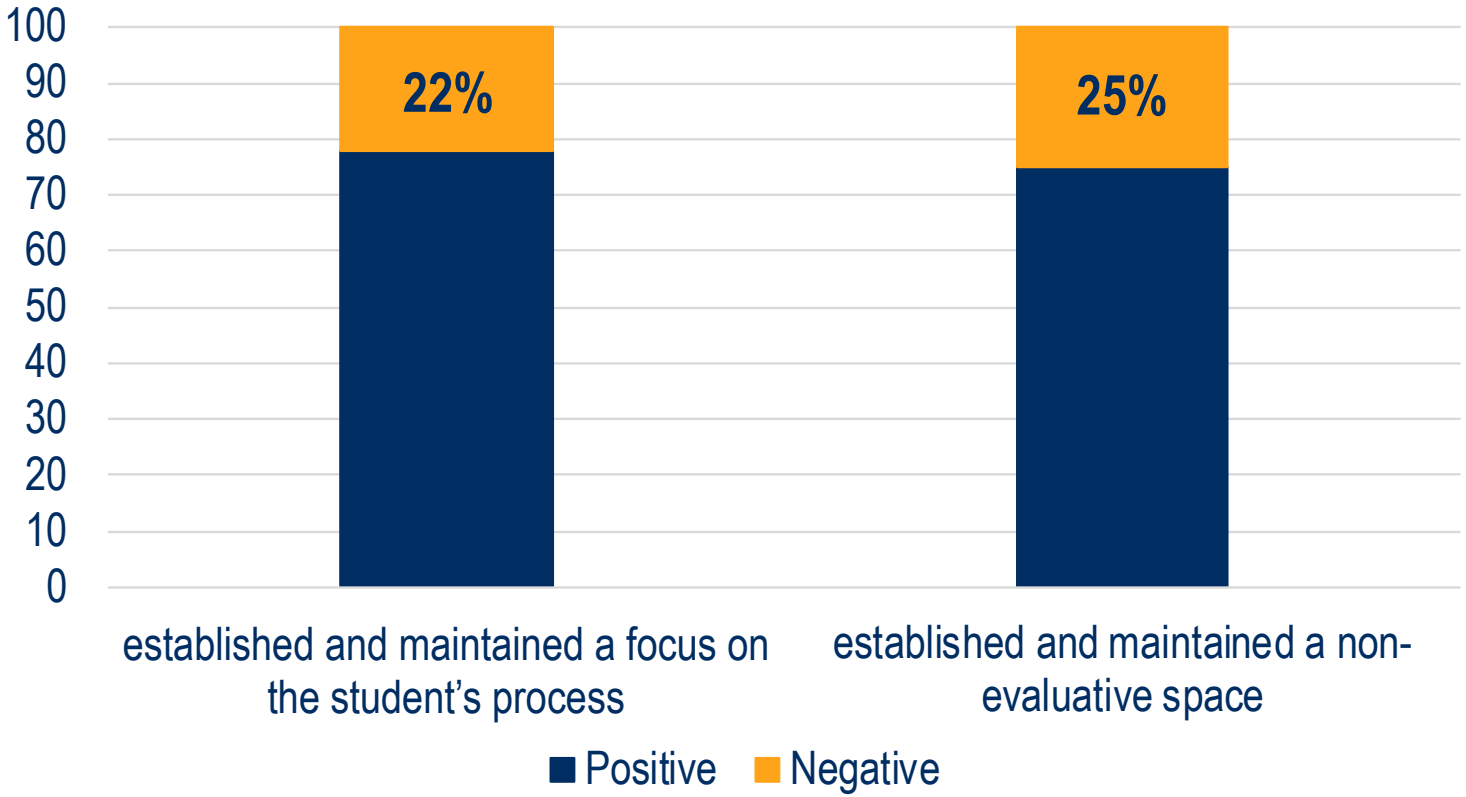
Two characteristics of ***eliciting student thinking*** that show respect for students and their thinking:

- establishing and maintaining a focus on the student's approach
  - ➢ while refraining from directing the student to a different process in a way that competes with the student's process
- establishing and maintaining a non-evaluative space in which students can openly share their thinking

RESULTS: ELICITING STUDENT THINKING



RESULTS: ELICITING STUDENT THINKING

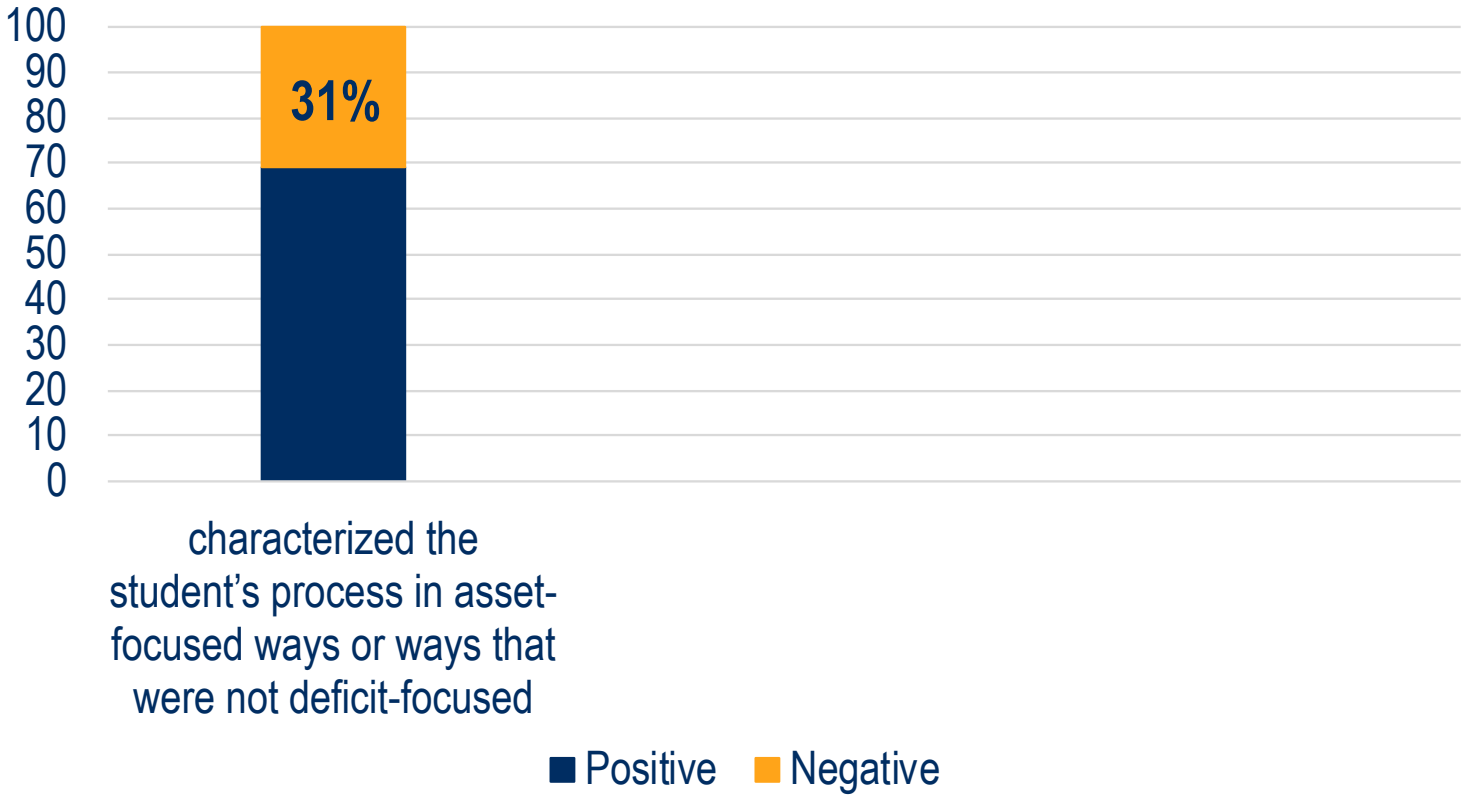


RESPECTING STUDENTS WHEN INTERPRETING STUDENT THINKING

Three characteristics of ***interpreting student thinking*** that show respect for students and their thinking:

- characterizing the student's process in asset-focused terms (or ways that are not in deficit terms)
- talking about the student's process itself without repeated reference to a different process
- characterizing the student's mathematical knowledge and skills in asset-based terms (or ways that are not deficit-focused)

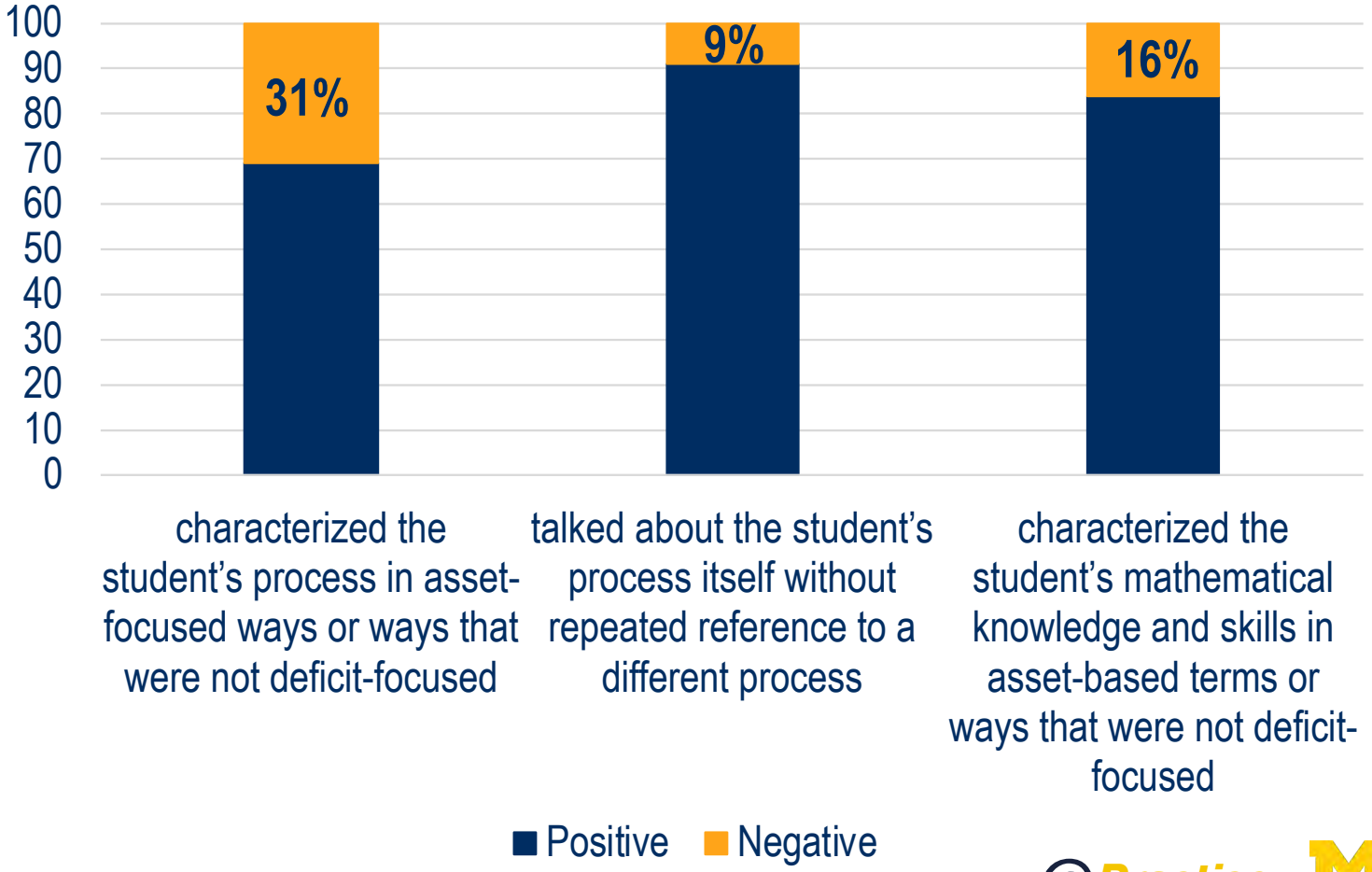
RESULTS: INTERPRETING STUDENT THINKING



EXAMPLE: CONCERN ABOUT THE STUDENT'S PROCESS

I am concerned about the borrowing from the left to right as opposed to from the right to the left. If for example, it would be a problem for something like five hundred eighty-three minus two hundred forty-five, borrowing from left to right might **raise some issues** of borrowing from the hundreds place, then from the tens place, then to the ones place when they only should be borrowing from the ones place- or the tens place to the ones place. **Usually you wanna start on the right side-** the ones place- and move over.

RESULTS: INTERPRETING STUDENT THINKING



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CONCLUSIONS AND NEXT STEPS

- Simulations can be designed to raise teaching dilemmas that will surface preservice teachers' teaching practices, mathematical knowledge, and potential biases → thereby making them available for noticing and addressing
- Preservice teachers at the beginning of teacher preparation are in need of interventions focused on respecting students and their thinking
- Even those preservice teachers who did not characterize the student and their thinking in deficit-focused ways were not always carrying out an asset-based approach to characterizing student thinking