Exploring Differential Instruction Strategies to Foster Students' Sensemaking in Science Classroom

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INTRODUCTION

In connection with a multi-year longitudinal professional development (PD) program, this research investigates a science teacher's learning to influence student sensemaking in the classroom so that they may more actively flourish in scientific thinking. Sensemaking in education involves the dynamic process of students actively constructing understanding through interaction with their peers and teachers (Brown et.al 2023). In science education, effective sensemaking occurs when teachers engage students in hands-on experiences and discourse to make sense of them to foster a holistic comprehension of concepts.

RESEARCH QUESTION

How does one science teacher differentiate her instruction approach to support students' senemaking?

METHODS

This study is established within a larger multi-year professional development project (LCD-PD). From this larger data set, we explored one high school biology teacher, Monica. Monica is a White, female science teacher who has been teaching for 10 years. To explore Monica's practice we used classroom video, audio, and interviews from her fourth year of professional development. From this, types of instruction were coded within the classroom video and compared across how she described them during interviews to better understand the goals of these instructional moves for facilitating sensemaking.

RESULTS

In Monica's interview and evident in her teaching the following types of instruction were found:

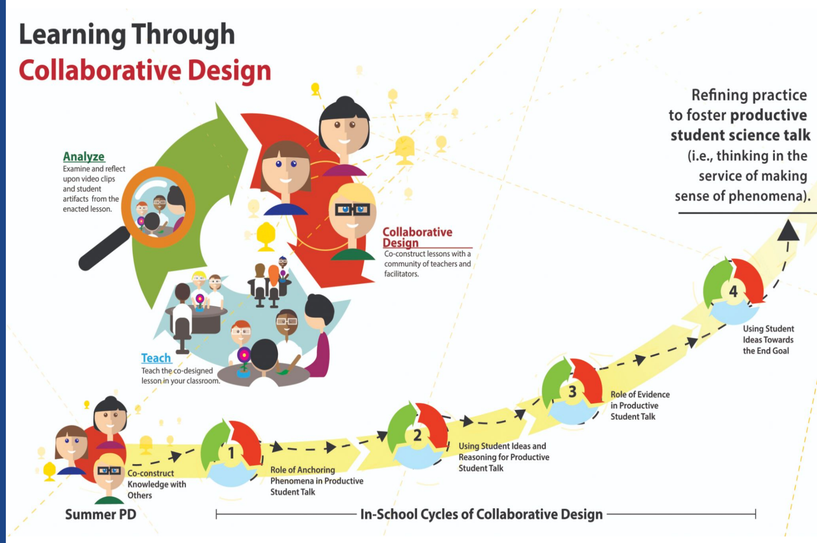
1. Incorporates student's experiences - For example,IB students likes to be independent and prefer lecture while other students are team driven and understand concepts through Lab

2. Trial and error - For example, she asked students to write the notes at home to have more time to discuss in class but this did not successfully work for her. Student felt as if they weren't adequately understanding concepts.Monica further responds by setting specific times in class for discussion.

3. Balance lecture and discussion - For example, Monica came to understand that one cannot do discussion all the time as it's too taxing on students and they need some lecture to shortened and expand on these ideas.

4. Alter difficulties of materials -Monica strategically adjusted the difficulty level of instructional materials, condensing complex concepts in activities like the cladogram lab to prevent student overwhelm. Her proactive approach fostered a more accessible learning environment, ensuring students remained engaged and motivated to navigate challenging content.

5. Promoting Student Autonomy and Inquiry-Monica skillfully fosters student autonomy and cultivates curiosity by encouraging them to formulate original thoughts and explore their interests, utilizing these as guiding frameworks within the learning process. She employs open-ended questioning techniques in laboratory settings to prompt critical thinking and reflection, facilitating independent inquiry and fostering meaningful scientific discourse.



CONCLUSION

Based on Monica's development and class performance it indicates that participation in a professional development (PD) program enhances science teachers' classroom practices. Utilizing these approaches create inclusive environments fostering conceptual knowledge and critical thinking. Teachers, like Monica, who understands how students' learn offer a variety of learning options and ensure everyone's success and,adapt teaching methods effectively. Monica encourages student-centered and interactive teaching, leading to deeper comprehension.

SELECT REFERENCES

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