

Portfolio Assessment in the Science Lab

Executive Summary

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Research Question/Definition of Problem

What happens when fifth grade students select the activities that best showcase their learning in portfolios?

- *What happens to student work and understanding in science when I develop activities informed by student intelligences and learning styles?*
- *How does choice change the culture of the classroom?*
- *How does choice in activities and the work affect student participation?*
- *What happens to student achievement when students are encouraged to reflect?*

Rationale

I worked with 5th grade students at Sumner because I have noticed that enthusiasm for science often declines by 6th, 7th, and 8th grade. Small class sizes and a high level of collaboration among the staff were also important.

I focused on portfolio assessment because it offered an opportunity to improve assessment, and therefore, student achievement. No one model was in place to assess student science learning at Sumner, and there was emphasis on grades tested in standardized tests. I also chose portfolios because they allow all students to showcase their strengths.

Data Collection

Students completed surveys before and after the project. They were asked whether they thought science was difficult, relevant in their lives, and important to school. They explained in more detail what they found difficult about science and school. I also conducted follow-up interviews with certain students, and used student work samples as sources of data. Data collection was disrupted when Science Lab classes were cancelled in order to allow the students to prepare for their standardized tests in reading and mathematics.

Analysis

1. Students Mastering Science Content:

Students who struggled academically showed greater improvement in their science knowledge and attitudes towards science.

2. Time to do Science Activities & Students Making Connections

Student mastery improved most when students had more time with limited topics, for example, when classroom teachers and the Science Lab teacher collaborated to create an integrated unit.

3. Creating Opportunities to Learn

Students responded to opportunities to learn like using more illustrations when writing was difficult or designing experiments to show mastery of science concepts like forces involved in flight. Improvements in student work were also more notable among students who struggled academically in subjects like reading.

4. Changes in Attitude:

Student attitudes remained generally favorable towards science, but there were fewer students who found science as enjoyable as at the beginning of the project. Also fewer students thought that science was important to being successful in school.

Conclusions

Standardized testing can change assessment practices in schools. When the students' classes were cancelled for a period of a few months to prepare them for tests in other areas, the project was never able to resume with the same momentum. Therefore, there is still a need for research into assessment that is appropriately tailored to student needs, relevant, and draws upon all the different goals that students need to master in science. Second, despite changes to the project, student learning improved when students were able to use their strengths to compensate for areas of academic weakness. Students who had not participated in class before became more engaged, and when the collaboration between teachers in the Science Lab and classroom was high, students had the time for reflection envisioned in the original project.

Barriers/Limitations

It was unclear how much students' attitudes changed because of the project or due to other factors. When classes were cancelled for the students, they were unable to complete their portfolios, and I relied on a variety of science lab assignments as data sources.

Policy Recommendations

1. Involve classroom teachers in the creation of assessment.
2. Create authentic assessments.
3. Develop awareness of how assessment practices can have unintended consequences.

