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Robert C. Idsardi Jr  
*University of Georgia*, boidsardi@gmail.com

Barbara A. Crawford  
*University of Georgia*, barbarac@uga.edu

Jaclyn K. Murray  
*University of Georgia*, jakspiel@hotmail.com

James F. Ammons  
*University of Georgia*, ammons.james@gmail.com

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This research involves the Science Practices in the Classroom Matrix (SPCM), an analytical tool used to identify the level of sophistication of scientific practices occurring in classroom lessons and the level of student versus teacher centeredness. The SPCM was developed through iterative rounds of coding videotaped lessons and confirming and disconfirming components of the Matrix, followed by a process of discussion and consensus building. The SPCM is being used to systematically determine how science teachers enact the scientific practices in their classrooms in meaningful ways. Additionally, implications of the use of the SPCM in prospective science teacher education and practicing teacher professional development will be discussed.

Purpose

- Students rarely have opportunities to engage in the scientific practices in their classrooms. The need arose to systematically analyze the nature of students' engagement in the scientific practices.
- An investigation is revised and carried out.
- Engaging in argument form evidence.
- Planning Investigations

Theoretical Framework

Teaching science as inquiry is engaging students in the natural and material world with the expert knowledge and views of inquiry and NOS.

Implications for research and teacher education

The SPCM has multiple uses. First, the SPCM will be used to differentiate teachers’ enactment of the scientific practices through the Fossil Finders professional development project. Recordings of their enactment of the Fossil Finders curriculum will be analyzed with the SPCM to compare teachers’ knowledge and views on inquiry and NOS both before and after the professional development intervention. Second, the SPCM may offer teacher educators a way to support practicing and prospective teachers in understanding the scientific practices of science, where learners grapple with data and ideas through systematic investigations.

Table 1. An option of the SPCM. The full SPCM covers all eight of the NGSS Science Practices

<table>
<thead>
<tr>
<th>Science Practices</th>
<th>a</th>
<th>b</th>
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<tr>
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<td>Carrying out Investigations</td>
<td>An investigation is carried out.</td>
<td>An investigation is available to students.</td>
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<td>Analyzing data</td>
<td>Data analysis is conducted through systematic quantitative (e.g., statistics) or qualitative methods to create visual representations.</td>
<td>Teacher analyzes data.</td>
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<td>Interpreting data</td>
<td>Interpreting data is conducted through visual representations.</td>
<td>Data analysis is conducted through systematic quantitative (e.g., statistics) or qualitative methods to create visual representations.</td>
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Table 2. Background experiences of teachers studied.

Overview of NJ’s and KN’s classrooms

DJ
- Carried out science practices mostly at an emerging level
- Students mainly guided in science practices
- Students engaged with a broad range of science practices in less depth

KN
- Carried out science practices using a combination of emerging and more informed levels
- Students were guided and worked independently in science practices
- Students engaged in few science practices in more depth

Acknowledgements

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