Guided Science Inquiry Instruction with Special Education Students

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Abstract
This study utilizes a mixed-methods research design to assess teacher perceptions regarding guided science inquiry and its application toward students from the special education population.

Introduction
- National and state educational mandates require students achieve proficiency in not only science content, but also science inquiry, or those process skills associated with science.
- Science inquiry instruction has been shown to improve student achievement and process skills.
- Guided scientific inquiry (GSI) is a student-centered, teacher-facilitated approach to science instruction where students are guided toward, but not directly presented, scientific concepts. Students are led by the teacher to develop the concept.
- GSI has been found effective in promoting student achievement.
- Research has not yet specifically examined the value of guided scientific inquiry among students drawn from the SPED population.

Research Questions
- How did teachers describe their experience implementing GSI among SPED students?
- Did teachers find GSI effective to use with SPED students?

Method
Participants
- 61 rural Midwestern teachers participating in a RCT study examining the coaching of guided scientific inquiry instruction.
- Following completion of coaching, the teachers answered selected questions assessing their experience with guided science inquiry and its effectiveness with SPED students.

Design
- Qualitative component featured analysis of an open-response question asking teachers to describe their experience using GSI with SPED. Responses were compiled and independently coded into seven categories.
- Quantitative analysis consisted of comparing frequency counts of teachers’ ratings of whether they used GSI with SPED population and how effective they felt it was.

Qualitative Results
Table 1. Categories of Teachers’ Descriptions of Experience Using Guided Inquiry with SPED Students

<table>
<thead>
<tr>
<th>Category ( # of responses)</th>
<th>Representative Quote</th>
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<tbody>
<tr>
<td>Hands-on approach led to better understanding (8)</td>
<td>&quot;Instead of relying so heavily on text, these students can be prompted for review with what they did instead of what they read.”</td>
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<td>Better inclusion/increased access for SPED students (5)</td>
<td>&quot;My special needs students were able to work side-by-side with my upper level students because they were able to work at their own pace and explore with everyone else.”</td>
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<td>Increased interest and engagement/participation (8)</td>
<td>&quot;They were more engaged and seemed to think deeper about the content than with traditional instruction.”</td>
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<td>Students can work at their own individual &quot;level&quot; (6)</td>
<td>&quot;It allows each student to work at a different level. Then everyone is able to contribute to the end result.”</td>
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<td>Generally positive/better than traditional instruction (4)</td>
<td>&quot;Special needs students seemed to do better with inquiry, especially ADD (Attention Deficit Disorders).”</td>
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<tr>
<td>Required some adaptation for SPED students (7)</td>
<td>&quot;With SPED students, I had to adjust my questioning and start out with more basic - knowledge/recall.”</td>
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<tr>
<td>Inquiry process lacked sufficient structure/was too abstract (9)</td>
<td>&quot;Caused frustration with a few students who dislike change. Sometimes was too abstract for understanding.”</td>
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Quantitative Results
- Among the 61 teachers participating, 48 (78.7%) reported using GSI with students from SPED populations.
- Of the teachers who used GSI with SPED students, 42 (87.5%) reported it was effective in meeting the students’ learning needs.

Discussion
- The results suggest that GSI instruction can be effectively implemented among SPED students.
- The majority of teacher responses suggested that a GSI approach provides SPED students with greater understanding, inclusion, and engagement with their science lessons than do traditional instructional methods.
- GSI’s flexibility allows for differentiated instruction.
- Limited concerns with the approach reported for these students included a need to adapt instruction in order to meet their needs, and difficulties among students grasping its occasionally abstract structure.

Future Directions
- Future studies may use student outcomes to examine the effectiveness of GSI instruction, possibly comparing group differences between general and SPED populations.

References
References will be provided at the request of conference attendees. Please provide the authors with your name and email address on the paper provided.
Suggested Citation:


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