

## **Using Guided Notes to Improve Academic Performance in a Chemistry Inclusion Classroom**

### **Abstract**

The study analyzes the relationship between guided notes strategies and academic performance, quality of notes and test anxiety. By explicitly teaching how to complete guided notes, these can then be used as a reference during open-book test, reducing test anxiety and increasing achievement in a high school inclusion chemistry class.

### **Statement of the Problem**

The 31<sup>st</sup> Annual Report to Congress on the implementation of the Individuals with Disabilities Act estimates that 79.3% of students spend at least 40% of the day inside a regular classroom. A 2007 study by Scruggs, Mastropieri, and McDuffie reported that lecturing by the teacher to the whole class is still the most common form of instruction in science classes. These lectures cover vast amounts of information and require the memorization and comprehension of vocabulary and facts as well as the understanding of abstract concepts, which can pose a challenge to students with disabilities (Boyle, 2011). Taking notes while someone is lecturing requires a student to listen to the information, process it and then copy it down, which can often be overwhelming and inefficient process, especially in vulnerable populations such as students with disabilities (Barbetta & Skuruppa, 1995). The traditional method of note taking can often lead to incomplete

notes for studying, causing anxiety and decreased performance. Although guided notes have been used in an array of settings, there is no research regarding how they affect performance in inclusion chemistry classes.

### **Purpose**

The purpose of this research is to show that providing students in a chemistry inclusion class setting with explicitly taught note-taking skills in the form of guided notes will increase note quality, improve student performance and reduce test anxiety.

### **Literature Review**

Science lectures will often cover a breadth of information at a fast pace, requiring students to memorize, understand and apply abstract concepts in short periods of time (Boyle, 2011). While this is often challenging to a general education student, a student with a disabilities is at an even higher disadvantage due to often having weaknesses in the areas of reading comprehension, synthesis of information and rote learning. A 2002 study by Gettinger and Seiberts, the research found that in all academic content, study skills had to be explicitly taught and regularly practiced in order for the learner to adequately acquire, organize, process, remember and apply what had been learned. Guided notes are teacher-made companion handout to the lecture that provides an outline of the material with certain critical information left blank for the student to fill in as the lecture progresses with the assistance of visual and auditory cues (Barbetta & Skaruppa, 1995;

Stringfellow & Miller, 2005). This method has been shown to scaffold the necessary skills for good note taking while encouraging meaningful and active learning (Heward, 1997; Stringfellow & Miller, 2005). The student is left with a standard, accurate and complete set of notes to study from and use during the test resulting in “higher test scores than students who only listen to the lecture and read the text” and decreased test anxiety (Heward, 1997; Barbetta & Skaruppa, 1995, Haydon, Mancil, Kroeger, McLeskey & Lin, 2011).

### **Research Methodology**

Research was conducted in four high school inclusion chemistry classes. While the intervention was applied to all students, data were collected and analyzed for 22 students in the class who are currently enrolled in special education services. Pre-intervention, baseline was collected by conducting two notebook checks, two exams, and two surveys. After the intervention had been applied, data were collected five times using the same measures. Weekly lectures had an accompanying guided notes handout in which the students would fill in the missing information with the aid of visual cues on a PowerPoint presentation or auditory clues from the instructor. Every few classes, students were asked to submit their completed guided notes, which were reviewed by the teacher for completion and correctness. During the exam for each chapter, the students were allowed to use their notes as a reference and were expected to correctly identify and apply the concepts. The grades from these tests were then graphed, along with the grades of two pre-intervention tests, to analyze for trends in performance. The exam also contains a

short, Likert-type scale at the end that asks them to rate test anxiety, perception of quality of notes and performance. Their answers to these questions will be used to calculate perceived test-anxiety, perceived quality of notes and perceived performance.

## **Findings**

The findings in this research are somewhat consistent to the research studies that were discussed in the literature review. This intervention focused on using guided notes, which has been shown to increase performance, as a way of reducing test anxiety and improving test grades. Overall, the trends in test grades were positive and one exception can be attributed to factors regarding difficulty level of curriculum. Guided notes also increased quality and completeness of notes in the majority of students and self-assessment by the students showed that students felt better and more confident with the quality of their notes, similar to the results attained during Barbetta and Skaruppa's 1995 study. Most students expressed that the notes not only helped them on their exam, but also reduced anxiety before the test. The number of students that expressed feelings less anxious before the tests steadily rose as the intervention progressed.

## **Implications for the Field**

When teaching the abstract concepts, intricate theories and heavy mathematical content of chemistry, a lecture-only format has been the predominate method used over the years. A lecture, however, requires listening, processing and transcribing information in a very short period of time, which can be a difficult task for many students with disabilities.

Guided notes can provide students with the skills to become better note takers, focusing less on writing and more on understanding and participating in the lesson, ultimately improving academic self-esteem and achievement. The implications of this approach can carry over to other advanced high school classes or college level courses where guided notes can be used to provide students with disabilities an avenue towards academic success.

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