

# The Use of Lab Notebooks Versus Rubric Based Lab Reports in Student Achievement

## Abstract

Throughout the year, I have noticed a disconnection between the learning of objectives from the laboratory portion and the classroom portion of the course. Students seem to have a hard time relating the content objective with the lab objective used to support and enhance the content. The purpose of this study was to investigate whether a rubric-based lab report or the use of a lab notebook is more effective when it comes to the learning objectives in a Chemistry I lab. Sub-questions that will be investigated will look at the benefits of a post lab discussion with both the rubric report and notebook, the students perceptions in using a lab notebook and lab report, the use of journaling in their lab notebooks, and which is more effective when it comes to lab writing and analysis skills.

### Research questions:

The focus of this study was to investigate whether the use of a lab notebook is more effective than a rubric based lab report when it comes to the learning objectives in a Chemistry I lab.

Sub-questions that were investigated include the following:

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### Background

Delavan-Darien High School - a small high school, about 900 students - in Delavan, Wisconsin, is about 50 miles southwest from Milwaukee. This is a semi-rural community with a diverse population from Hispanic immigrants, farmers, and blue-collar workers to upper-middle class.

### Student Sample

Chemistry I is traditionally a junior level class, offered after students have taken general science and biology. I have four sections of Chemistry I this year, which are comprised of 90 students. Sixteen percent are seniors, of which nineteen percent are repeating Chemistry I. Thirty-eight percent are juniors and 47% are sophomores. Two percent are in the bilingual program. Due to scheduling, forty-five percent of students switched teachers at semester.

### Treatment/research design

Research question	Data Sources			
	1	2	3	4
Focus Question	Post lab quizzes	Questionnaire/survey	Interviews	Formative assessments
Sub question 1	Post lab quizzes	Questionnaire/survey	Interviews	Formative assessments
Sub question 2	Post lab quizzes	Interviews		
Sub question 3	Post lab quizzes	Questionnaire/survey	Interviews	
Sub question 4	Questionnaires	Interviews		
Sub question 5	Post lab quizzes/tests	Questionnaire/survey	Interviews	Formative assessments

Treatment for comparing the different formats, Lab Notebook and Rubric Lab Report. Each lab will be divided comparing different aspects of the study

Section	Lab1	Lab2	Lab3	Lab 4	Lab5	lab6
1	Rubric	Notebook	Rubric\ discussion	Notebook\ discussion	Notebook\ discussion	Notebook\ journaling
2	Rubric	Notebook	Rubric\ discussion	Notebook\ discussion	Notebook\ discussion	Notebook\ journaling
3	Notebook	Rubric	Notebook\ discussion	Rubric\ discussion	Notebook\ journaling	Notebook\ discussion
4	Notebook	Rubric	Notebook\ discussion	Rubric\ discussion	Notebook\ journaling	Notebook\ discussion

### Conclusions:

Eightyfour percent of students interviewed stated they saw a great value in the use of Lab Notebook/Report format with the use of post lab discussions. They felt that using the Lab Notebook/Report enhanced their learning of the concepts in class as opposed to the use of a Rubric Report. The most common complaint was the amount of writing required with Lab Notebooks.