

The Determination of the Conceptual Literacy of General Chemistry Students by Topic

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[Pre- and Post- Question data to support/dispel faith-based instruction]

Abstract:

Students have answered assessment questions before and after lessons. Do these performances indicate that some lessons are more familiar to students while other topics are not? The eventual goal of this study is to optimize class/course time by addressing the less familiar ideas in more detail in subsequent years.



Make class more interesting and engaging!

Faculty

A versatile tool that can be readily incorporated into your teaching philosophy.

How can I start?

[Faculty Apply Now](#)

Students

Participate in class and engage with new material like never before.

See how.

Researchers

Discover trends and gather anonymous data with ease.

Learn how.

See how the Concept Warehouse can help in your classroom!



- Share your experiences and contribute to the community
- Find, create, and share conceptual questions

Context:

An examination of the general chemistry curriculum.

Background and Frameworks:

Scientific Literacy:

knowing basic facts and concepts about science and having an understanding of how science works

<http://www.nsf.gov/statistics/seind04/c7/c7s2.htm>

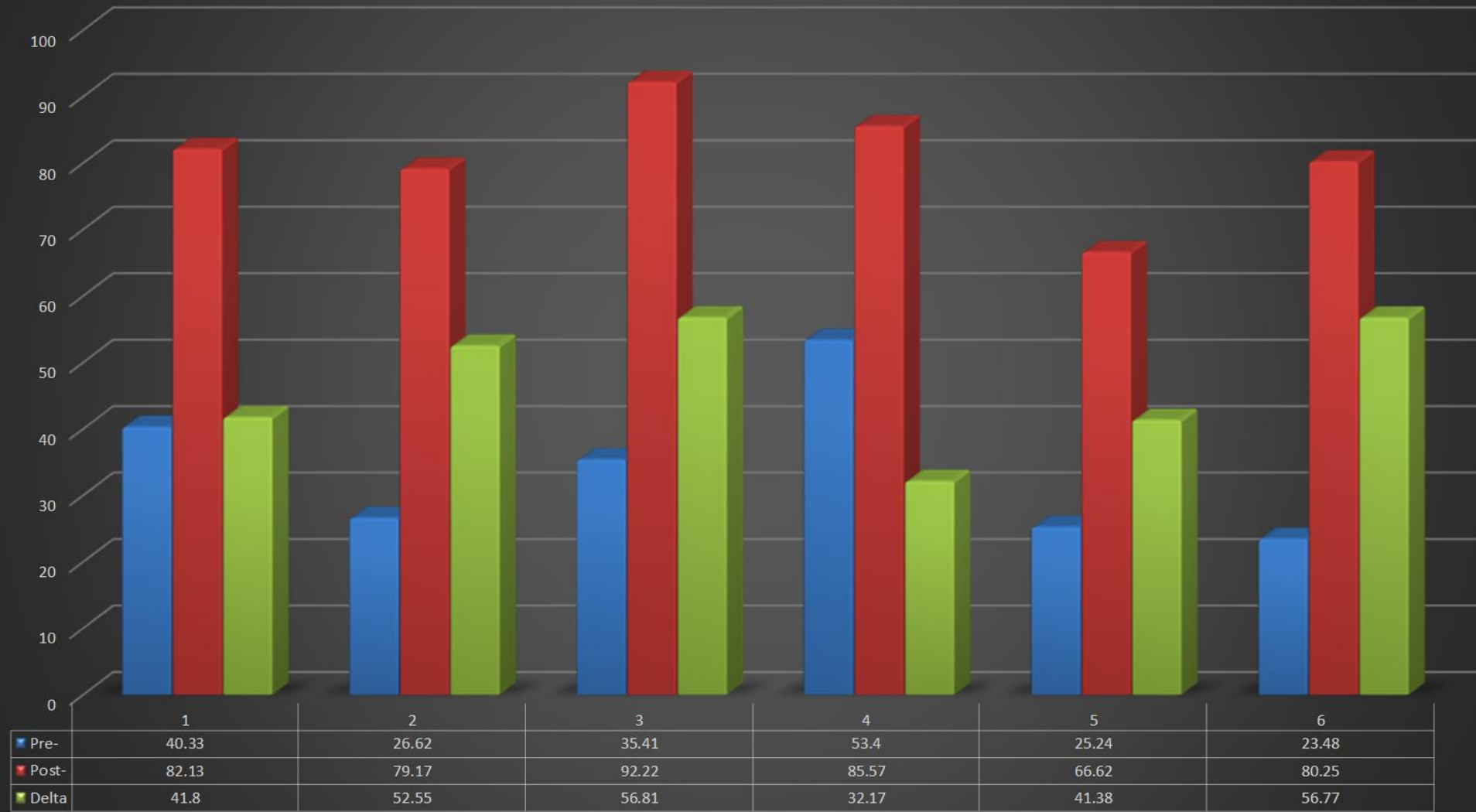
Numeracy: solving problems in a mathematical context

<http://depts.washington.edu/opbblog/2013/10/new-oecd-study-finds-america-lags-behind-in-literacy-numeracy-technology-skills/>

Black Holes, Bermuda Triangle, and Lost (The TV Show)



CH 233 Spring 2015 Pre (Blue) and Post (Red) and Delta (Green)



Acids/Bases

Transition Metals

Nuclear

Electrochemistry
 ΔG , ΔS , ΔH

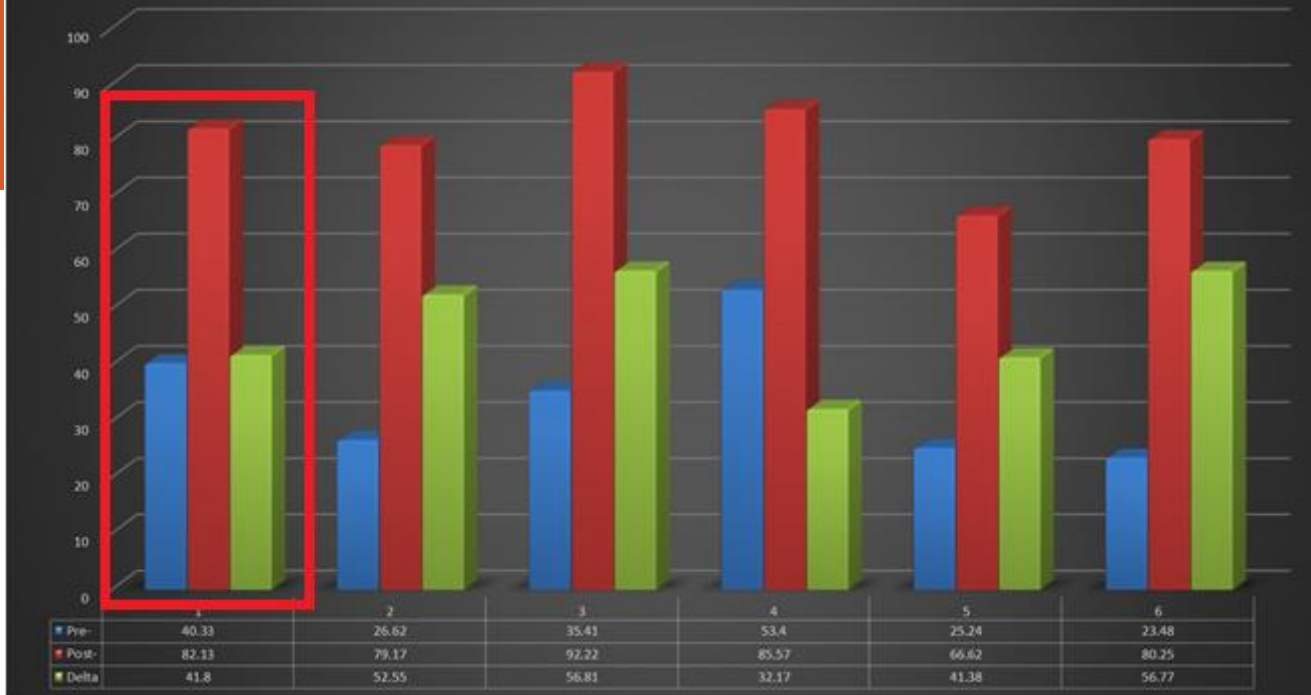
Organic

Likert Scale:

- (1) Strongly disagree
- (2) Disagree
- (3) Neither agree nor disagree
- (4) Agree
- (5) Strongly agree

“The concepts studied in the Acids and Bases unit were extensively studied in High School.”

“Compared to all general chemistry units, the concepts studied in the Acids and Bases unit in CH 233 were challenging to master.”



“The concepts studied in the Acids and Bases unit were extensively studied in High School.”

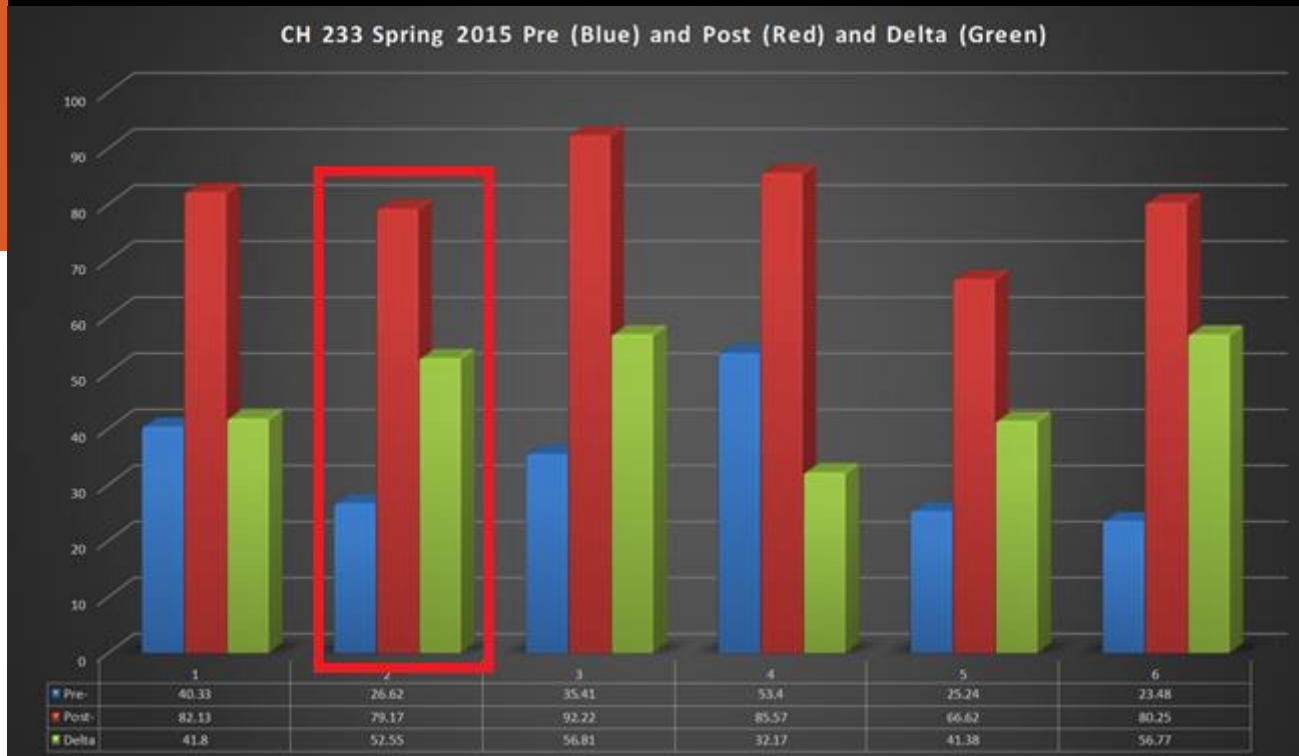
4.2

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree

“Compared to all general chemistry units, the concepts studied in the Acids and Bases unit in CH 233 were challenging to master.”

3.3

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree



“The concepts studied in the Transition Metals unit were extensively studied in High School.”

1.6

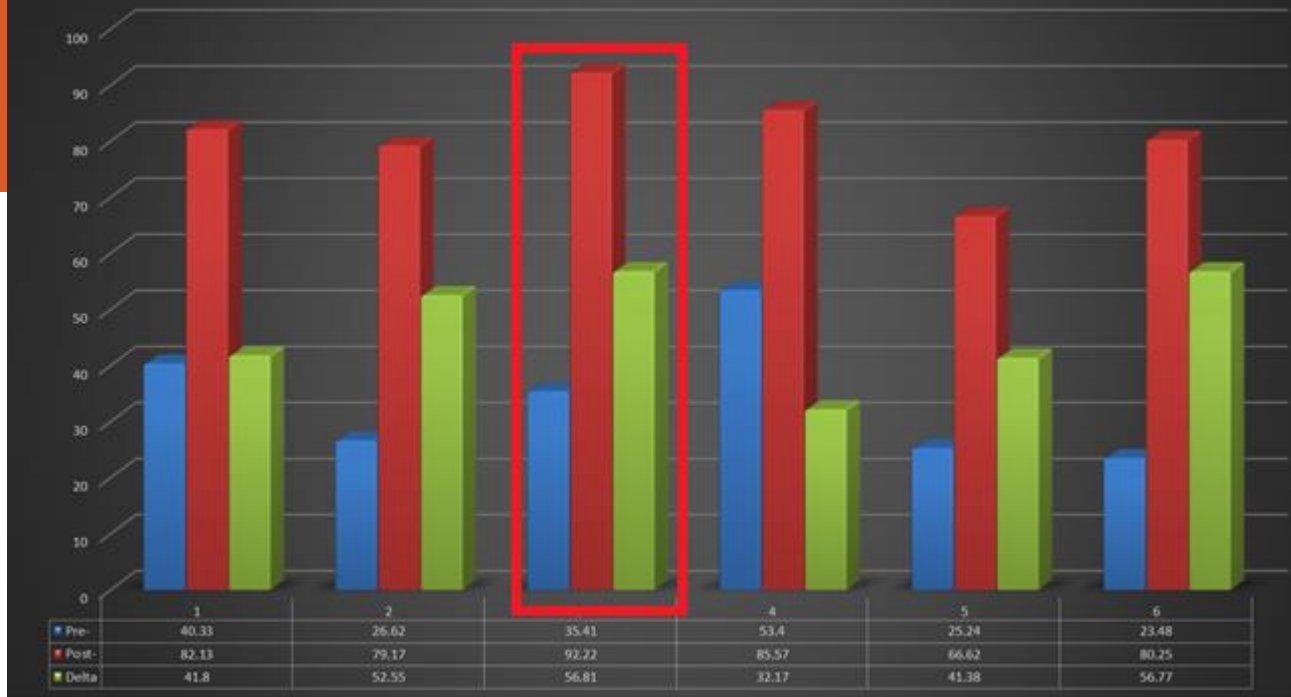
(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree

“Compared to all general chemistry units, the concepts studied in the Transition Metals unit in CH 233 were challenging to master.”

2.7

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree

CH 233 Spring 2015 Pre (Blue) and Post (Red) and Delta (Green)



“The concepts studied in the Nuclear unit were extensively studied in High School.”

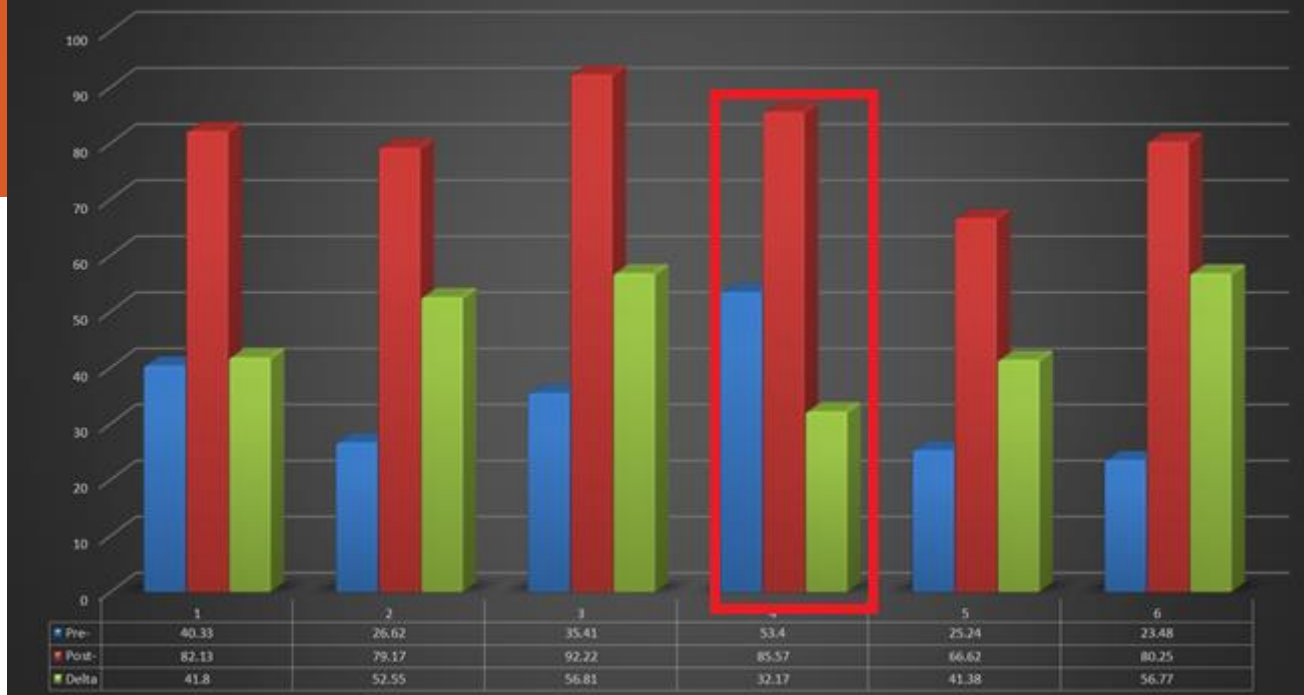
1.8

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree

“Compared to all general chemistry units, the concepts studied in the Nuclear unit in CH 233 were challenging to master.”

1.3

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree



“The concepts studied in the ΔG , ΔS , ΔH unit were extensively studied in High School.”

4.6

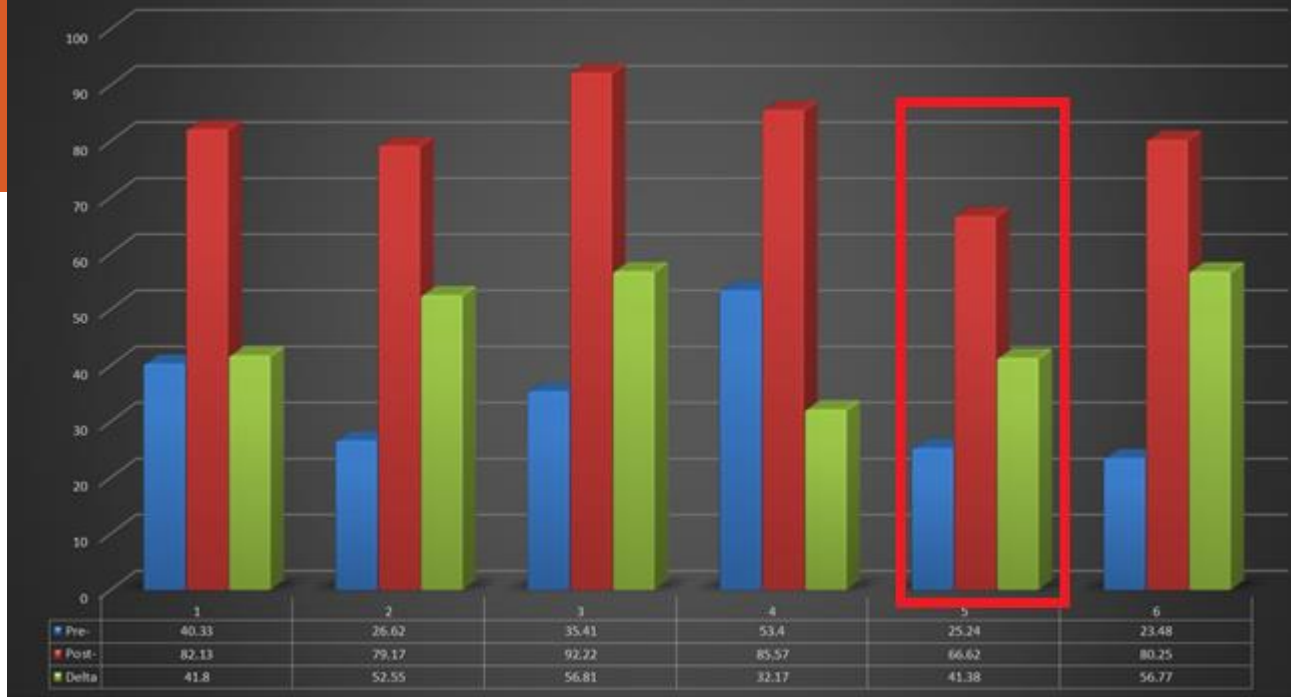
(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree

“Compared to all general chemistry units, the concepts studied in the ΔG , ΔS , ΔH unit in CH 233 were challenging to master.”

3.8

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree

CH 233 Spring 2015 Pre (Blue) and Post (Red) and Delta (Green)



“The concepts studied in the Electrochemistry unit were extensively studied in High School.”

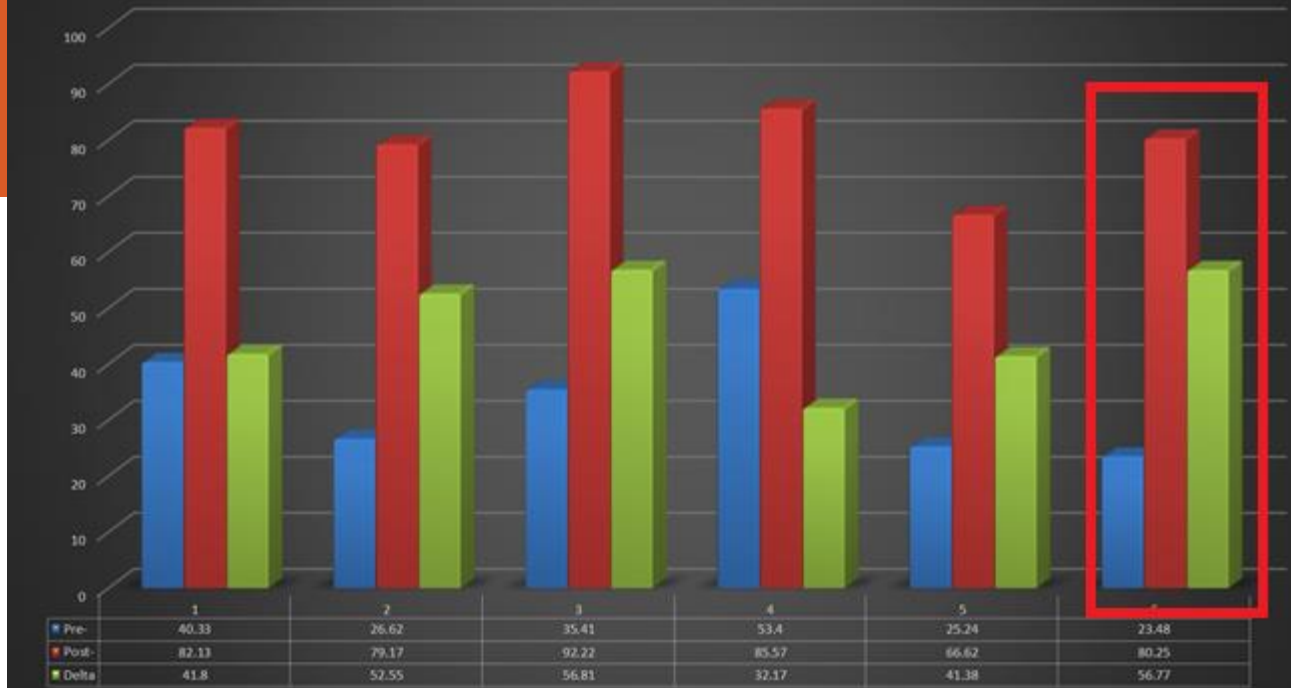
2.1

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree

“Compared to all general chemistry units, the concepts studied in the Electrochemistry unit in CH 233 were challenging to master.”

4.7

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree



“The concepts studied in the Organic unit were extensively studied in High School.”

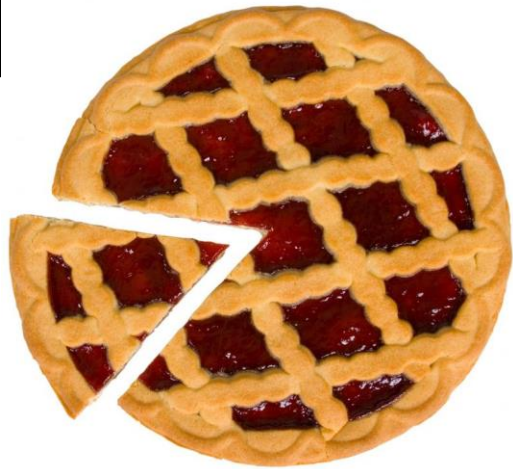
2.8

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree

“Compared to all general chemistry units, the concepts studied in the Organic unit in CH 233 were challenging to master.”

2.6

(1) Strongly disagree / (2) Disagree / (3) Neither agree nor disagree / (4) Agree / (5) Strongly agree



Increased the “number of electrochemistry lectures” from 4 to 5 from 2015 to 2016.
Reduced the “number of organic lectures” from 5 to 4 from 2016 to 2015*.

Student Performance:

Electrochemistry Exam Questions: 72.2% to 79.5%

Electrochemistry Quiz Questions: 66.6% to 74.8%

Organic Exam Questions: 80.4% to 80.3%

Organic Quiz Questions: 80.3% to 77.4%

* A Take-Home Assignment covering hydrocarbon nomenclature and structure was added.



**KEEP
CALM
AND
Open up another
Can of Worms**

Interviews with HS Chemistry Teachers revealed that many Biologists are teaching HS Chemistry.

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