THE EFFECTIVENESS OF CONCEPT CHECKS USED PRIOR TO LECTURE IN A FLIPPED CHEMISTRY CLASSROOM

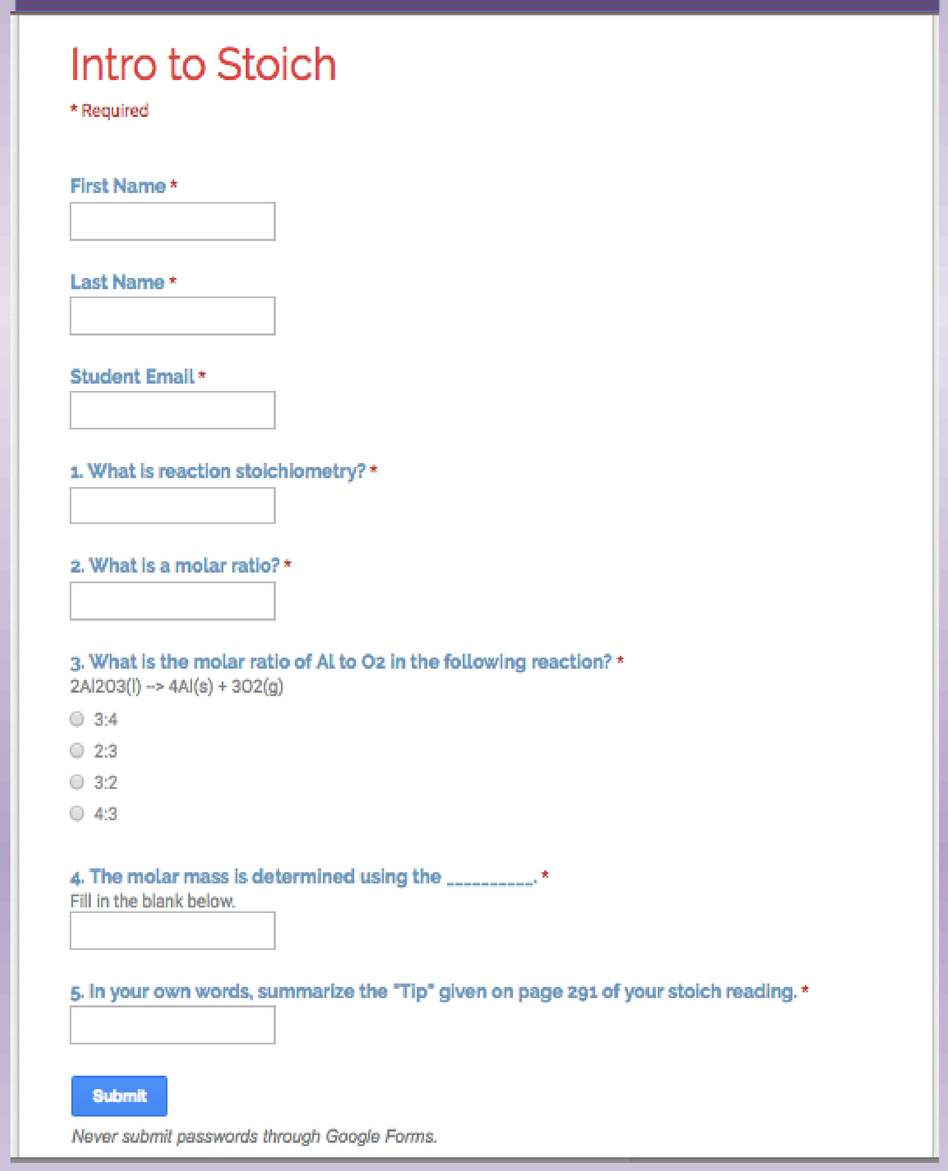
Background

My classroom research project analyzes the effectiveness of concept checks in a 10th grade flipped Pre-AP Chemistry course. A typical flipped classroom consists of short video lectures viewed by students prior to attending class, thus, allowing for more in class practice, activities, discussions, and teacher/ student interactions. In effort to increase the number of student views on video lectures from previous semesters, I created and implemented mandatory "concept checks" to supplement these videos. Through the implementation of mandatory concept checks, I expect to see an increase in video views and more content acquisition from the students prior to attending class.

Intervention

Fifty- one 10th grade students from my Pre-AP Chemistry class completed concept checks over a nine week intervention period. Mandatory concept checks were approximately five questions in length and correlated directly with the assigned tutorial video for each given topic. Three different chemistry content units were covered in the intervention period. Each unit contained six mandatory concept checks equating to two concept checks per week by each student.

Sample Concept Check



Intro to Stoich

* Required

First Name *

Last Name *

Student Email *

1. What is reaction stoichiometry? *

2. What is a molar ratio? *

3. What is the molar ratio of Al to O2 in the following reaction? *
2Al2O3(l) --> 4Al(s) + 3O2(g)

- 3:4
- 2:3
- 3:2
- 4:3

4. The molar mass is determined using the _____. *
Fill in the blank below.

5. In your own words, summarize the "Tip" given on page 291 of your stoich reading. *

Submit

Never submit passwords through Google Forms.

Research Questions

Focus Question

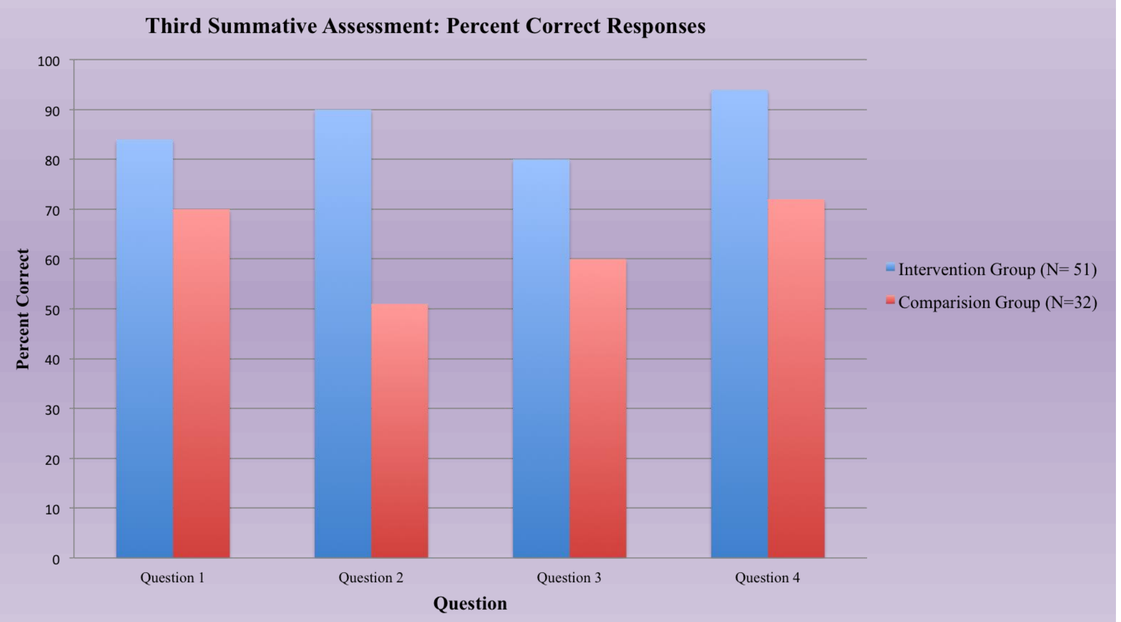
Does the completion of concept checks improve content mastery of out-of-class lecture?

Sub Questions

1. Does the completion of concept checks increase student understanding of the material prior to attending class?
2. Was the completion of concept checks crucial to student content processing during the following class period?
3. Were only the provided resources utilized by the students for the completion of concept checks OR were additional resources utilized?

Data Collection Methods

	Source #1	Source #2	Source #3
Sub Question #1	Student interviews: pre-assessment	Student interviews: post-assessment	Student surveys: post-assessment
Sub Question #2	Student surveys: post-assessment	Major summative assessment scores	Student interviews: nine-week completion
Sub Question #3	Comparison of video views to submitted concept checks	Comparison of concept check questions to summative assessment questions	Resource specific questions imbedded in concept checks



Comparison of correct student responses from the intervention group (*N*= 51) to the comparison group (*N*= 32) for specific test questions that were directly covered within concept checks.

Excerpt from a student interview

"The concept checks helped me identify what specific questions I had over the topic. I was able to come to class the next day knowing what I missed on that specific concept check and get clarification on my misunderstanding."

Conclusion

Data collected from this classroom research project supports the effective use of concept checks in my flipped classroom. Summative assessment scores showed an overall grade increase for students in the intervention group. In addition, student interviews and surveys provided me with positive feedback on how the concept checks were of benefit to my students.

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