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Kristin Buch  
*Valparaiso University*

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# Secondary Student Metacognition Compared to Actual Participation in the Classroom

Kristin Buch; Dr. Del Gillispie  
Valparaiso University



## Background

In many high school classrooms, as well as college, classroom participation is considered a vital portion of a grade. With this in mind, observation of a high school science classroom at Chesterton High School and at Wirt-Emerson Visual Performing Arts High Ability Academy were conducted along with a survey completed by the students. Each student was observed for the beginning of the class period, was interrupted briefly to complete the survey, and then was observed again after survey for the same amount of time. Because of class scheduling, Chesterton was observed for 30 minutes before and after, while Wirt-Emerson was observed for 20 minutes at a time.

After the completion of the survey and observations, the students at Chesterton had an average of -2.125 accuracy for number of hands raised total while, at Emerson, the students had an average accuracy of -.88. There was no significant difference in the recordings before and after the survey was completed.

How often do you raise your hand?			
0-5	6-10	11-15	16+
How often do you get called on when your hand is raised?			
0-5	6-10	11-15	16+
How often do you get called on when your hand is not raised?			
0-5	6-10	11-15	16+

Figure 1. Example of survey completed

## Methods

After working with the cooperating teacher at Chesterton High school in Chesterton, Indiana, the survey is as above in Figure 1 was given to students, while being observed. Information was tabulated and then compared to that of the information from the students at Wirt-Emerson VPA. The students at Chesterton had been observed for 30 minutes, took the survey, then were observed for a second 30 minutes. Because of difference in class schedule, the students at Emerson were viewed for 20 minutes both before and after the survey.



The totals from each class were figured and then compared as two units, one for each school. The topic for the Chesterton school was squid dissection while the topic at hand for Emerson was DNA replication through transcription and translation. Once the surveys were filled out, they were coded. The students from Chesterton were given a letter, while the students from Emerson were given a letter prime, to show the difference between data sets. Each survey was coded and then the names were removed and thrown away, to keep confidentiality.



## Results

During both sessions, there was little difference between the first and second observation times. Because of this, the scores were then tallied together, rather than as individuals. The raw scores of general hand raising are shown below in Figure 2.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
Hands Raised	0	2	0	0	1	1	2	2	2	0	3	2	1	2	2	3	
Assumed Hand's Raised	5	5	5	15	5	5	5	10	5	5	10	10	10	10	10	5	
False assumptions	0	0	0	10	0	0	0	4	0	0	3	4	5	4	4	0	

	A'	B'	C'	D'	E'	F'	G'	H'	I'	J'	K'	L'	M'	N'	O'	P'	Q'	R'
Hands Raised	5	3	2	3	2	1	0	0	2	2	1	0	0	0	2	4	2	0
Assumed Hand's Raised	5	5	5	5	5	5	5	5	5	5	5	5	5	5	10	10	10	10
False assumptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	4	6

Figure 2. This is the raw data, coded, to show the actual number of times students raised their hands compared to the lowest number in the range that they circled on the survey. Based on this the false assumptions were tallied together.

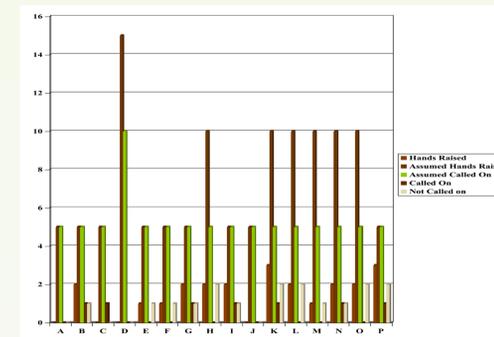
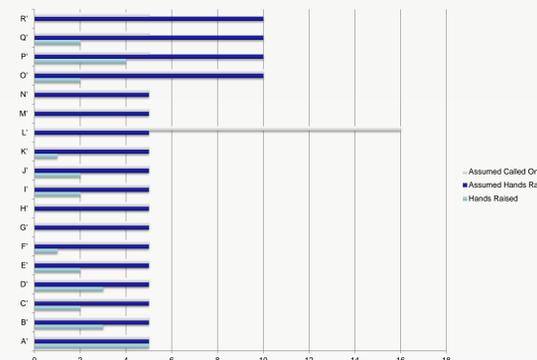


Figure 3. (above) This is a graphical representation of the survey answers and the true data collected during the observations of Chesterton High School. And Figure 4 (below) shows the same for Wirt Emerson.



## Discussion

In looking at the data, it looks as if the majority of students are aware enough of their participation, it is only squewed by a few students from each class that change the numbers around. I think in future teaching, this can be a useful too in showing students who they can or do earn participation points. If more students can accurately number the amount of times they raise their hand to ask valid questions or answer the questions posed to them, the better students they will be in perceiving other aspects of their educational life.

## Conclusion

Overall, I believe that students are able to become more metacognitive, with practice. Obviously, students vary from topic to topic and day to day, but their underlying perception increases throughout life. A next step in this research would be a series of in class assignments that fine tune perception skills. If these could be worked on in a class setting, students may become more self-aware in their participation.

## Acknowledgments

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Contact Information  
Department of Education  
Valparaiso University