Exit with a Tweet: Using Twitter as an Exit Ticket

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Abstract

Does Twitter help students achieve at a higher level? Students used Twitter as an exit ticket in one class for 4 weeks and their results were compared to students in a non-Twitter class. Students using Twitter for class saw in increase in test scores (6%), while students in a non-Twitter classes saw a decreases (-6%) in test scores. These results indicate the Twitter may help students retain information, and in turn, achieve at a higher level academically.

Introduction

You can feel the anxiety build as the teacher calls on other students in the class, and you realize your name will probably come up soon. Everyone has felt that nervousness when a teacher calls their name to respond to a question. You wonder if you will know the answer, and are praying you do so you don't embarrass yourself.

In every classroom there is a diverse population of students. There are always students who dominate the class, students who are extremely quiet, and other students who fall somewhere in between. The amount of anxiety each student feels in a classroom when being call on is different. What if you didn't have to answer verbally? One solution is to use a social media site such as Twitter. Twitter allows people to tweet in 140 characters or less.

Students need to participate in class to connect with the content being taught. Instead of only communicating verbally students in my classroom were using Twitter for some of their classroom communication. According to the community of inquiry model, COI, students learn through the interaction of 3 areas: social, cognitive, and teaching presence. This biggest influence is the way the classroom is run as "social context greatly affects the nature of learning activities and outcomes" (Garrison, Anderson, & Archer, 2000). Twitter may help to reduce any

social anxiety students have in the classroom. This, in turn, could help students to learn from each other. The goal of using Twitter was to create an environment where students would feel comfortable sharing their knowledge with the class, and potentially the world.

My starting question was how does Twitter affect quiet students? After looking at my data a new question arose. Does Twitter help students to achieve at a higher level?

Literature Review

Twitter, when intentionally integrated into the classroom, can promote higher engagement of students in the classroom. In a study done by Junco, Heiberger, & Loken (2010) they found that using Twitter heightened engagement, and that the average GPA of those who used Twitter was about 0.5 points higher. They concluded that, "using Twitter in educationally relevant ways can increase student engagement and improve grades." Another study done 2 years later by Junco, Elavsky, & Heiberger (2012) concluded 3 main ideas from the use of Twitter. The first, is that when students are required to use Twitter there is an increase in student engagement, compared to students who were allowed to make a to choice on whether to use Twitter or not. They also concluded that faculty who engaged their students on Twitter saw a higher level of academic gains in their students. Finally they found "having a theoretical reason to use Twitter and implementing that reason into the course pedagogy will maximize the benefits achieved." Another study done by Birnholtz, Hancock, & Retelny (2013), found that students were engaged when lecture contained slides with their tweets and 90% recommended it should be used again.

There is not a lot of research completed, right now, because the use of Twitter in education is a fairly new idea. "There is a growing body of scholarly research suggesting that,

when used properly, social media can boost both learning outcomes and student engagement. The key phrase in that sentence is 'when used properly.' The problem is that research in this area is still relatively limited, and most of what is being done in classrooms is experimental. No one has figured out definitively what does and does not work" (Copeland, 2012). It is important to note that not all students are at the same level of understanding in using Twitter. Therefore, one way to effectively use Twitter is to "instruct students in using social media critically and intentionally to optimize learning outcomes" (Abe & Jordan, 2013). In the study done by Copeland (2012), it was noted that students who were reluctant to use Twitter tended to struggle more than those who adopted the use of Twitter.

There are many concerns about using Twitter. A top concern about Twitter, or other social media sites, is that is could distract students from content. (Novak & Cowling, 2010). Another concern is that there could be some disconnect between Twitter and the class itself. "They almost act as two separate parts of class and don't always connect, it can be confusing at times" (Miami Student, 2013). Instructors could also fear that Twitter might "encourage bad grammar as a result of its 140-character limit, or that it could become time-consuming and addictive (Dunlap, 2009).

There are also many positives noted when Twitter is used effectively. According to Dunlap and Lowenthal, you can get instant answers or feedback ("*Tweeting"*, 2009). In another article by Dunlap and Lowenthal, they conclude that interactions on Twitter are more natural and occur quicker than using discussion boards ("*Instructional"*, 2009). Something that really intrigues me is that "students are getting the idea that their community of learners can extend outside of the classroom" (Messner, 2009). In the study done by Birnholtz, Hancock, & Retelny

(2013), that I mentioned earlier, “students applied course concepts to examples from their lives (2009: 57%; 2010: 68.6%; 2011: 62.6%).”

Classroom shyness can be a huge issue, but Twitter may help with that. “Students in another Twitter-friendly classroom at Purdue University agree that digital communication helps overcome the shyness barrier. Studies frequently discover that greater participation translates into better academic performance, motivation, and a likelihood of adopting different points of view, which is why it is so striking that Twitter can foster that type of communication” (Fernstein 2010).

Methodology

I teach in a rural village in western Alaska, where the population of my classes is 100% Yup’ik students. By rural village, I mean that we are not connected by any roads to another village. We must fly to go anywhere outside of the village. There are about 600 residents, and 200 students in grades K-12 in the village where I teach. I teach science to students in grades 7-12.

My study only included students in the 10th grade and above, as I used my biology and physical science classes. Biology is tracked for 10th graders and physical science is tracked for 11th graders at our school, but sometimes other students get mixed into the class as well. I have 9 students who are in both classes and I will use them as a comparison to the whole class.

A few weeks before collecting data I assisted students in creating a Twitter account, and they practiced posting. I required students to post something before they left class, as an exit ticket. I did this 3 days a week for 4 weeks. I gave bonus points to students who commented on

other students tweets in a way that was meaningful to the class, or they earned bonus points for tweeting more than once.

When I introduced the idea of Twitter to my students, most seemed excited. According to my pre-survey, 81% of students either liked the idea or were neutral (Appendix E, Table 20). However, when I asked students why they thought Twitter would be helpful or not I got varying answers, from “I think Twitter will help me because when I read other people's tweets I learn little bit more” to “The Twitter doesn't help me. But Facebook does??” Based on this starting response, I was very unsure of the results I would get.

My data consisted of a pre and post survey (see Appendix D for the survey and Appendix E for data from the survey), tweets sent to our class hashtag (Appendix A), classroom observations (Appendix B), and student grades on chapter tests (Appendix C). I observed 2 classes, biology where Twitter was used and physical science where Twitter was not used. There were about 20 students in each class.

For the students using Twitter, I gave them a list of what they could tweet about. They could either post what they learned, ask a question, post a resource (such as a video, article, picture, etc.), tell what they want to learn about next, or anything else related to class. I separated tweets into 6 main categories: learning, questions, resources, responses to tweets, miscellaneous, and a category for tweets that were the same as a previous tweet by the student. Table 1 shows the coding I used.

Table 1. Twitter codes

M=Miscellaneous	Q=Question
L-H=helpful learning	R=resource
L-N=Not helpful learning	S=same post
I=Response to a tweet	

When sorting the tweets I found the need to further classify learning comments into 2 categories: helpful and not helpful. An example of a helpful learning tweet is "I learned that osmosis lets water through the cells." Something that was considered not helpful learning was "I learned about the cell membrane." This was not helpful because it would not help anyone else in the class learn. The next category I looked at was the miscellaneous category which was created for tweets that may not relate to class content. There were very few miscellaneous comments such as "I learned that you have to go with the flow." I'm not really sure where this tweet came from, so that is why it was classified as miscellaneous. It was definitely not related to class material. Another category was the resource category and this was not a very popular category. All resources that were posted were either pictures found online or web links to helpful sites.

For observations in physical science and biology class I observed only the 9 students who were in both classes. This was to see if there was a difference in the number of comments made verbally during a class period. For the most part, I tried to count all comments regardless of the content. I focused my data collection on one student on any given day. This was so that I did not get overwhelmed and miss comments. It was a struggle to make observations for just one student, as I was still teaching the class. I collected data for each of the 9 students once, and then

took an average to see how many times an average student participates in any given class. Then I calculated an average for both biology and physical science.

I used a pre and post survey to see if student perception changed over the course of my study in the biology class (Appendix D). I asked basic questions to start with just to be sure I was getting valid responses. Sometimes students just pick answers and don't read the questions. Then I asked questions relating to the class. I asked if they liked science class, if they liked Twitter, how comfortable they were with Twitter, and if they thought Twitter helped them do better in class. These were all multiple choice questions. The last question of the survey was open-ended and asked students why they thought Twitter was helpful in class. Appendix E shows the results of the survey.

In addition to these 3 sources of data I also looked at student grades on chapter tests to see if there was any difference between the class using Twitter and the class that was not using Twitter. I also compared test scores to students who took the classes last year. The test I used this year was the same as the test I used last year.

Results

Here are some of my key findings from the study. I first looked at the participation rate for the students using Twitter.

Table 2. Twitter Participation in Biology

Whole Class	66%
9 Students in both classes	72%

Table 2 shows the average participation rate for students using Twitter during the 4 weeks that Twitter was used in biology class. I went through the tweets to see who posted and who did not. Then I went through my attendance and took out the students who were absent.

Next, I looked at participation in the classroom. I wanted to see if 1 more comment, via Twitter, would really make a difference. If students were already communicating a lot without Twitter, then one tweet may not make much of an impact.

Table 3. Average Class Comments (9 Selected Students)

Biology	2
Physical Science	2

I found that students were commenting, on average, twice a day in class (table 3). Tweeting before leaving class brings the total up to an average of 3 comments in a day. So 2 days of tweeting would be the equivalent of one class day as far as verbal class participation is concerned. This told me that Twitter had a chance to make a huge impact in student performance. This requirement to interact one more time before leaving class could help students succeed in the classroom.

Finally, I got to the test data. I knew students using Twitter were interacting more with class material, so I wanted to know how this impacted them academically. Table 4 shows the class average for 2 chapter tests.

Table 4. Class averages for Tests

	Test 1	Test 2
Biology '15-'16-used Twitter	47%	53%
Biology '15-'16 (9 students)-used Twitter	50%	57%
Biology '14-'15	63%	60%
Physical Science '15-'16	70%	64%
Physical Science '15-'16 (9 students)-used Twitter in Biology class only	68%	69%
Physical Science '14-'15	69%	60%

Test 1 was given before we started Twitter, and test 2 was given during the last week of Twitter data collection. I found that the test scores went up for students who were using Twitter but went down for every other class. This proved that Twitter was making a difference for my students.

Discussion

Twitter and my classroom had a major battle before I started my data collection. It seemed as if Twitter did not want to accept our friendship. We struggled to get working accounts for every students, and along the way, I wondered if maybe I should just give up and try something else. I hated the thought of giving up, so we persevered and eventually we won our battle with Twitter. Everyone was set to go. It took about 2 to 3 weeks prior to collecting data to get everyone signed in with an account that could post, but we were only spending 5 to 10 minutes each class working on it.

According to COI, students benefit from the connections they make with their classmates and teachers. I think a big part of this is having students who are willing to try new things, and

who feel comfortable in the classroom. To me this means students are willing to participate and they don't hate coming to class. As far as participation in the class goes, table 3 shows that the average student in my class is making about 2 comments a day. When you add 1 tweet, this is a 50% increase. Students need to communicate with others to build on their learning. Twitter is a great way to do this.

Most students were willing to participate. According to table 2, the participation rate for 4 weeks was 66%. Now let's go back to the battle I mentioned earlier about our start with Twitter. A few students had to put up even more of a fight. They either got locked out of their account or their account was marked for suspicious behavior. This may account for the percentages being a little on the low side.

Table 5. Survey Question 5-How do you feel about science class?

	Love/Like	neutral	Dislike/Hate
Pre	**38%**	**38%**	**25%**
Post	**63%**	**13%**	**25%**

On the survey, I asked students how they felt about science class. Before Twitter students were spread across the board. Table 5 shows that more students liked the class (38%) or felt neutral about it (38%) than disliked the class (25%). After 4 weeks, more students liked the class (63%) than before we used Twitter and none hated it, but 25% still said they disliked science class. Regardless, this was still improvement in student perception of science class. This improvement led me to believe that the social presence aspect of COI was very true. My students seemed to feel comfortable in the classroom and on Twitter. In fact, they seemed to even like the class more. Whether this increase in enjoyment of the class was due to Twitter or other

circumstances is hard to tell. However, I did not change anything else in my classroom so some of this increase is most likely from the addition of Twitter.

My next concern was the type of tweets students were posting. This is related to the cognitive presence aspect of COI. Were students actually tweeting about class related material, and were these tweets actually helping others learn? For the most part students seemed to be taking Twitter seriously. By looking at tables 6 and 8, in Appendix A, it is clear that most students either tweeted what they learned or tweeted a question. A limitation of my data is that it does not take into account tweets that did not include the hashtag for our class. Some students did get off task occasionally, but most students signed in and posted their tweet, then moved on to other class work. We had a very limited time to post, minimizing off task time. Most of the time I would remind students in about the last 5-7 minutes of class to tweet if they had not already done so.

Finally, I went back to my initial question of how does Twitter affect quiet students. I first looked at the 2 louder students and 2 quieter students. One of the quiet student's test score went up and the other student’s went down. The same trend occurred for the louder students. This left me puzzled so I went on to physical science, and the same thing happened. I think the sample was too small for the question.

Another factor might be how I teach. This would be related to the teaching presence aspect of COI. How do I interact with my students and how might this be reflected back in student behavior? I try to do as little lecture as possible. I limit most of my talking to directions. If I plan to do more direct teacher instruction, I will break the class into groups. This way I am focused on a smaller group and can teach to their level. The groups complete different activities

and then rotate the next day. One station will involve a lot of teacher help while the other stations require little teacher assistance. Therefore, the group a student is in determines how much a student may participate on a certain day.

I only observed 9 students so I was curious as to how those 9 students compared to the whole class. I wanted to know if they were an accurate representation for the class. This led me to look at test scores. To my surprise the class using Twitter, biology, raised their test scores from 47% to 53% (Table 4 above). The first test was before Twitter was included as a part of the class and the second test was after 4 weeks of using Twitter. When I compared the 9 students that are in both classes to the average for biology class, I found the same results. These students went from a 50% to a 57%. Then I looked at physical science and found the opposite for the whole class. The class average dropped from a 70% on test 1 to a 64% on test 2. I began to wonder what the trend was in previous years. So I calculated a class average in both physical science and biology for the previous school year. I found that both classes dropped.

I began to wonder how the 9 students did in physical science. When I took out the 9 students, I got a result I was not expecting. Their average score went from a 68% to a 69%. This made me wonder if there might be a type of “spillover” effect. In physical science, I did not use Twitter. I think some students got in the habit of posting at the end of biology class, so they had to remember what they learned. I wonder if this became more of a habit and they started to think about what they were learning in class. When I looked at some tweets from biology, I realized that a few students had mixed the classes. They sent tweets to the biology hashtag that related to the physical science material. A question that might be worth studying in the future is does

Twitter help build learning skills that help students retain what they learn? The scores are so close it is hard to tell if Twitter may have caused this or if it was just coincidence.

Conclusion

So did Twitter help students achieve at a higher level? According to my data it did help. I have so much data and it was all very interesting. Before looking at the data I did not expect to find anything. This increase in test scores was a big surprise. When I showed it to the students they really didn't seem to care. A couple have been disappointed that we haven't been using Twitter while some are ecstatic. It is a very mixed opinion. Students either seem to hate Twitter or they love using it. Just like every routine I use in the classroom it will take some getting used to. I also think I need to look into other ways to use Twitter besides just an exit ticket. If you don't keep things fresh in the classroom students get bored, so I need to find a way to reenergize my students into using Twitter. From this initial test it appears Twitter was very successful, but more testing would need to be done to confirm this.

After looking at all of my data my question changed from how does Twitter impact quiet student to does Twitter help students to achieve at a higher level? I found that the class that used Twitter raised their class average on a chapter test by 6%. On the other hand, in the class that did not use Twitter their class average dropped by 6%. I think it helped my students more than they would like to admit. Based on this small sample of data, I came to the conclusion that Twitter can be an effective method for increasing classroom participation, and in turn can help students academically.

I used Twitter as an exit ticket so it is hard to tell whether the increase in test scores is more attributable to exit tickets, Twitter, or a combination of both. Student verbal communication

during class was calculated to be about 2 comments a day. Adding a requirement of 1 tweet is a 50% increase. This is a major increase in communication, leading me to believe that Twitter may be the bigger factor behind the increase in test scores. According to COI, students benefit from the connections they make with others, and I think Twitter is a great way to incorporate a social connection.

In the future, I would like to continue this research and see if I get similar results with different classes. It would also be interesting to see if the results change when our village gets 3G. From survey data, I learned that many students do not always have access to internet outside of school. I thought this might be the case but wasn't 100% sure until I received the survey results. I noticed that many students did not participate in Twitter outside of their 1 required tweet per day. I wonder if students had internet access if they would have tweeted more. There are so many ways to use Twitter, and I would like to continue to explore the endless possibilities it can offer in my classroom.

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Appendix A: More Twitter Data

Table 6 shows the tweets sorted into categories. Refer back to table 1 to see the coding. Most tweets were either helpful learning or questions.

Table 6. Number of Tweets for the Whole Biology Class

	M	L-H	L-N	Q	R	S	I	Absent	No post
Week 1	3	18	8	7	0	1	0	5	10
Week 2	1	16	7	4	4	1	1	9	14
Week 3	6	22	7	34	0	2	15	4	14
Week 4	1	13	8	7	1	0	0	3	25
Total	11	69	30	52	5	4	16	21	63

Table 7 shows how my participation rates were calculated for table 2.

Table 7. Biology Participation Rate for the Whole Class

	Total Posts	# of expected posts	% participation
Week 1	37	52	71
Week 2	34	48	69
Week 3	86	53	72
Week 4	30	54	54
		Average	66

Table 8 is like table 6 but just for the 9 students who are in both classes. I just wanted to be sure the 9 students were a good snapshot of the whole class. The 2 biggest categories for them were learning and questions, which was the same as the whole class

Table 8. Number of Posts For Selected Students in Twitter Class

	M	L-H	L-N	Q	R	S	I	Absent	No post
Week 1	2	8	4	4	3	0	0	0	6
Week 2	1	11	0	3	2	0	1	3	7
Week 3	5	11	2	31	0	2	7	1	7
Week 4	0	9	5	3	1	0	0	0	9
Total	8	39	11	41	6	2	8	4	29

Table 9 is just like table 7, but again, it is only for the 9 students in both classes. I was just checking to see if the 9 students were representative of the whole class.

Table 9. Biology Participation Rate for 9 students also in Physical Science

	Total Posts	**# of Expected Posts**	**% Participation**
Week 1	21	27	78
Week 2	18	24	71
Week 3	58	26	73
Week 4	18	27	67
		Average	72

Appendix B: Class Participation

*Student numbers for Biology class are the same. So student 5 in table 9 is the same student who is number 5 in tables 11, 12, and 14.

Table 10 shows the number of times each student participated in biology class on the day I observed them.

Table 10. Biology Class Participation

Student	# of Comments
5	1
6	0
7	0
9	1
10	2
15	2
16	2
17	6
18	1
Average Comments	2

Table 11 shows the number of times each student participated in physical science class on the day I observed them.

Table 11. Physical Science Class Participation

Student	# of Comments
5	3
6	0
7	2
9	1
10	6
15	0
16	1
17	1
18	1
Average Comments	2

Appendix C: Test Data

*All highlighted scores are the 9 students that were in both biology and physical science. Again, student numbers are the same as in Appendix B.

Table 12 shows biology test scores this year by student.

Table 12. Biology Test Scores ('15-'16)

Student	Ch. 2 Test (Before Twitter)	Ch. 7 Test (After Twitter)
1	30%	47%
2	57%	60%
3	50%	40%
4	33%	Test not taken
5	53%	53%
6	60%	73%
7	27%	57%
8	37%	60%
9	67%	77%
10	63%	60%
11	60%	47%
12	33%	43%
13	47%	33%
14	Test not taken	67%
15	37%	33%
16	43%	43%
17	47%	60%
18	53%	57%
19	43%	47%

Table 13 shows the class average for test scores in biology class. I used Table 12 to calculate the average for this year (‘15-’16). I also went back in my gradebook to look at last years (‘14-’15) test scores because I used the same test.

Table 13. Biology Average Test Scores

	Ch. 2 Test	Ch. 7 Test
Average ('15-'16)	47%	53%
Average (9 students)	50%	57%
Average ('14-'15)	63%	60%

Table 14 shows physical science test scores for this year by student.

Table 14. Physical Science Test Scores (‘15-’16)

Student	Ch. 2 Test	Ch. 3 Test
20	73%	53%
21	63%	77%
22	83%	53%
23	83%	Test not taken
5	67%	63%
6	77%	80%
7	63%	60%
9	87%	77%
10	80%	73%
24	40%	43%
25	83%	53%
26	80%	47%
27	73%	77%
15	67%	40%
16	60%	80%
17	33%	77%
18	80%	70%

Table 15 shows the class average for test scores in physical science class. I used Table 14 to calculate the average for this year (‘15-’16). I also went back in my gradebook to look at last years (‘14-’15) test scores because I used the same test.

Table 15. Physical Science Average Test Scores

	Ch. 2 Test	Ch. 3 Test
Average ('15-'16)	70	64
Average (9 students)	68	69
Average ('14-'15)	69	60

Appendix D: Surveys

Pre Survey

General Info

1. Are you male or female?
2. How old are you?
3. Do you have internet access at home? *all the time, sometimes, never*
4. On average, how much do you contribute to the class verbally? (answer questions, ask questions, etc.) *Never, as little as possible (once a day or less), an average amount (2-3 times a day), all the time (4 or more times each day)*
5. How do you feel about science class? *love it, like it, neutral (don't care), dislike it, hate it*

Twitter Use

1. How often do you use Twitter? *Never, sometimes (1-2 days a week), often (3-4 days a week, all the time (5 or more days a week)*
2. How do you feel about using Twitter in school? *Love it, neutral (don't really care), hate it*
3. How comfortable do you feel using Twitter? *Expert (I use it all the time), intermediate (I have used Twitter before, but don't know everything about it), Novice (this is my first time using Twitter)*
4. Do you think using Twitter will help you do better in the classroom? *Yes, no, I don't know*
5. Why do you think Twitter will help you or not help you?

Post Survey

General Info

1. Are you male or female?
2. How old are you?
3. Do you have internet access at home? *all the time, sometimes, never*
4. On average, how much did you contribute to class including Twitter? (answer questions, ask questions, etc.) *Never, as little as possible (once a day or less), an average amount (2-3 times a day), all the time (4 or more times each day)*
5. How do you feel about science class? *love it, like it, neutral (don't care), dislike it, hate it*

Twitter Use

6. How often do you use Twitter? *Never, sometimes (1-2 days a week), often (3-4 days a week, all the time (5 or more days a week)*
7. How do you feel about using Twitter in school? *Love it, neutral (don't really care), hate it*
8. How comfortable do you feel using Twitter? *Expert (I use it all the time), intermediate (I have used Twitter before, but don't know everything about it), Novice (this is my first time using Twitter)*
9. Do you think using Twitter has helped you do better in the classroom? *Yes, no*
10. Did you feel more comfortable posting on Twitter or verbally making comments in class? Why?

Appendix E: Survey Results

Tables 16 through 22 show the data I received from the pre and post survey I gave to my biology class. All that are percentages are marked with a percentage. All that have no percent sign are the actual number of students who responded with that answer.

Table 16. Survey Question 1-Are you male or female?

	# of Responses	Male	Female
Pre	**16**	**56%**	**44%**
Post	**16**	**56%**	**44%**

Table 17. Survey Question 2-How old are you?

	15	16	17	18	19	20	21
Pre	**2**	**9**	**2**	**1**	**0**	**2**	**0**
Post	**3**	**9**	**0**	**1**	**0**	**1**	**2**

Table 18. Survey Question 3-Do you have internet access at home?

	All the time	Sometimes	Never
Pre	**31%**	**38%**	**31%**
Post	**38%**	**38%**	**25%**

Table 19. Survey Question 4-On average, how much do you contribute to class (Post-including Twitter)?

	Never	1/day	2-3/day	4/day
Pre	**0%**	**31%**	**56%**	**13%**
Post	**0%**	**25%**	**50%**	**25%**

Table 20. Survey Question 6-How often do you use Twitter?

	Never	1-2/day	3-4/day	5/day
Pre	**38%**	**19%**	**25%**	**19%**
Post	**25%**	**13%**	**31%**	**31%**

Table 21. Survey Question 8-How comfortable do you feel using Twitter?

	Expert	Intermediate	Novice
Pre	**25%**	**25%**	**50%**
Post	**38%**	**38%**	**25%**

Table 22. Survey Question 9-Do you think using Twitter will help you do better in the classroom (Post-Did Twitter help you in the classroom)?

	Yes	No	I don't know
Pre	**56%**	**13%**	**31%**
Post	**38%**	**19%**	**44%**