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Technology in the classroom: effect of student blogging on learning gains in a high school classroom

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TECHNOLOGY IN THE CLASSROOM: EFFECT OF STUDENT BLOGGING ON LEARNING GAINS IN A HIGH SCHOOL CLASSROOM

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ABSTRACT

This study explores the benefits of student use of web logs (blogs) in a high school Biology classroom. Students were assigned to blog by answering questions on topics from the Miller and Levine (2010) Biology textbook, which correlated to the Louisiana Grade-Level Expectations (GLEs), benchmarks that should be familiar to students at the end of a course. Raw gains (from pretest to posttest) were compared for the study group of 124 ninth and tenth grade students to determine if blogging increased student learning gains by increasing student accountability. The Louisiana Enhanced Assessment of Grade-Level Expectations (EAGLE) test bank was used to create multiple choice pretests and posttests based on Louisiana GLEs.

Analyses were done to compare class level (Honors and Regular), gender, and LEAP English Language Arts (ELA) levels. No statistically significant correlations due to blogging were found in these comparisons, though student accountability, effort, and engagement were increased based on teacher observations.

INTRODUCTION

What can you do to make students take full responsibility for their own learning? Make them tell the whole world what they have learned through blogging! Writing web logs (blogs) as well as reading the blogs of others has shown to extensively benefit students in terms of obtaining content knowledge (Ellison and Wu, 2008; Davi *et al.*, 2007; Du and Wagner, 2005; Tekinarslan, 2010). In teaching 9^{th} – 12^{th} grade high school students, I have observed that in this broad range of ages there is one substantial thing in common when it comes to their own learning – they want to be given information. No thinking. No explaining. No responsibility. The latter is my main focus for one simple fact: self-motivated students score higher (Bandura and Schunk, 1981).

With a push for educational consistency and diligence across the state, comprehensive End-Of-Course (EOC) tests are mandated as a replacement for graduation exit exams (Louisiana Department of Education, 2011). Educators must find a way to make students take charge of their own learning and strengthen them to retain knowledge for these now state-mandated comprehensive assessments. Louisiana EOC tests are taken at the end of a course and are designed to test the Grade-Level Expectations (GLEs), benchmarks indicating what a student should know at the end of a course (Louisiana Department of Education, 2011). Students cannot graduate by simply keeping their grade point average up; teachers cannot get their students to pass comprehensive assessments by teaching everything outlined on the syllabus. Often students can keep up with course material by preparing at the last minute for a chapter

or unit test, but this method does not seem to sustain knowledge for a comprehensive assessment (Du and Wagner, 2005).

Of the many tools available to teachers, it is apparent that student blogging closely resembles the online communication to which our students are drawn on their free time. During a practice blogging exercise for the current study, one high school student commented that the software was "just like a Twitter for school." It is obvious that online communication is popular with each class of students that enters high school, so why not use that to our advantage? According to a Pew research Project lead by Lenhart *et al*. (2010), 93% of teens (ages 13-17) use the internet and 73% of teens actively use social networking sites. By embracing a technology with which students are so comfortable, the subject of Biology can seem a little less intimidating and learning can become more student-centered. Self-motivated students have shown to benefit significantly more on quantitative assessments than students who are not (Bandura and Schunk, 1981). Blogging in the classroom can be the avenue that shifts responsibilities from teacher to student through self-motivation.

In a study of Turkish undergraduate students in a Computer II course, Tekinarslan (2010) determined the effects of blogging on scores using a pretest-posttest method. Students were initially assessed using a researcher-designed pretest with 40 multiple-choice questions regarding instructional technology. An identical test was used as a posttest after the blogging assignment was completed. All students were assigned readings in texts regarding five issues of instructional technology. The participants in the experimental group posted 1500-word blogs on their own reflections of the

readings, while the control group posted blogs about familiar topics relating to their majors. All participants were required to read and comment on at least two other students' blogs. It was determined that the mean posttest scores of the experimental group (n = 34) were statistically higher than the control group (n = 34). The group selected to read and blog about course material had significantly higher scores than those who only read about the course material (Tekinarslan, 2010).

In a study of Hong Kong undergraduate information systems majors, Du and Wagner (2005) determined the correlation between levels of blogging and exam performance. Students were asked to document their personal learning reflections in blog format for nine weeks (one per week) throughout the course. Their blogs were to include reflections on assigned readings, discussions, former learning experiences, and personal opinions regarding the blogs of other classmates. Each blog was then graded on a scale of one-four by an outside evaluator, and each student was then given an average score of their nine blogs. A regression analysis of average blog scores versus exam scores determined that average blog scores are a significant predictor of exam scores (Du and Wagner, 2005).

In a Bentley College study, Davi *et al.* (2007) determined students' perceived benefits of blogging using surveys. The study was conducted in three different courses: writing, e-commerce, and American politics. In the writing course, first-year undergraduate students were required to blog in response to weekly readings and service-learning assignments as well as respond to at least one other student's post. In the e-commerce course, a master's level course, students were chosen weekly and

required to post a discussion question based on a weekly reading, while other students enrolled in the course were then required to respond to any questions on the blog. The students assigned to blog would change each week, giving all students a chance to participate in the act of blogging at least once during the course. In the American politics course, undergraduate students were required to give their interpretation of a newspaper topic, often from *The New York Times,* in a blog format, while the remaining students commented on at least two of the posts. The participants in the undergraduate and graduate study were asked to answer on online survey rating their experiences with blogging as it related to their learning outcomes. The survey was composed of fifteen questions with numerical, Likert scale answer choices ranging from one to seven, as well as two short answer questions probing students to comment on their overall experiences with blogging. The final results showed that 76% of participants (n = 98) felt that blogging throughout the course afforded them a greater level of knowledge of the course material and 73% felt that it deepened the level of class discussion. The short answer results demonstrated that many students voiced the need for demonstrations of expected blogging before the actual blogging assignment (Davi *et al.*, 2007).

In a Midwestern undergraduate study, Ellison and Wu (2008) determined students' perceived benefits of blogging using surveys, similar to the previously mentioned study. Junior and senior students in an elective course outlining the "social impacts of new communication technologies" were required to complete six writing assignments throughout the course. Of the six assignments, three were turned in

traditionally (hard copies) and three were posted as blogs, affording all students in the class three written and three blog opportunities. Students were required to comment on at least two other blogs for two of the three blog assignments. A survey was given to all students, with a scale of zero - four, to gauge their perceived experiences with blogging, specifically on the benefits of traditional writing assignments, writing a blog, reading a blog, and getting peer feedback on a blog in relation to their acquisition of course knowledge. According to the analysis of Ellison and Wu (2008), the final results (n = 58) showed that students perceived reading other students blogs (M = 3.89, SD = 1.30) was significantly more helpful than completing a traditional written assignment (M = 3.36, SD = .92). Reading the blogs of other students (M = 3.78, SD = 1.38) was also perceived to be significantly more helpful than getting peer feedback on a blog (M = 3.38, SD = 1.40) (Ellison and Wu, 2008).

Throughout this thesis I will attempt to demonstrate the quantitative effects of blog writing and reflection on student learning gains from pretests to posttests in a ninth and tenth grade Biology classroom. In previously researched studies, the study groups were undergraduate and graduate level courses, while the present study uses high school students in ninth and tenth grade. The blogging concept is also being applied to a science course, while previous research used technology, writing, and politics courses. It is hypothesized that students assigned to blog will have greater learning gains than students turning in an identical written assignment.

MATERIALS AND METHODS

The current study is designed to test the effect of student blogging on raw gains in Biology I from pretest to posttest. The study group was composed of ninth and tenth grade students at Brusly High School, a rural public school in West Baton Rouge Parish, Louisiana. In the school's total population, 47% qualified for free or reduced lunch. Demographics of the study group are similar to the total population of the school (Table 1). Slight differences are seen between the Caucasian and African American populations due to the participation of two honors classes, which are both composed of mainly Caucasian students.

Table 1: School and study demographics

	School n = 550	Study N = 124
Caucasian	61%	71%
African American	37%	27%
Hispanic	2%	2%
Other	<1%	0%

Students were divided randomly into A and B groups in each class period to designate control and experimental groups. The purpose of the A and B division was to accommodate the multitude of variables (honors, regular, ninth grade, tenth grade) and to designate a control group for each class. Control and experimental groups were alternated each unit to give all students at least one blogging assignment. This study was run once in Units 3 (The Life of a Cell), 4 (Genetics) and 5 (Change Through Time) using the Miller and Levine (2010) Biology I textbook.

Students in both the experimental and control groups were given a completion grade for taking a 20-question multiple-choice pretest created using the Louisiana Enhanced Assessment of Grade Level Expectations (EAGLE) test bank. Students were enticed to highly regard the assessment by awarding two bonus points to the top scoring student in each class. Louisiana EAGLE is online software for educators to create online practice tests accessible to students with a personal username and password (Louisiana Department of Education, 2011). Each unit pretest test was manually created by selecting the unit GLEs. Each GLE on EAGLE is linked to specific questions to assess each GLE. All students were then taught using a combination of lecture and lab instruction following the Louisiana GLEs with the use of the Miller and Levine (2010) Biology I textbook.

In each unit students were given question sheets (between six – eight questions) to work on individually in class. The questions were constructed response format, meaning the questions were open ended and required higher order thinking to reach the final answer. The control group was to complete the questions and turn them in on a separate sheet of paper at the end of the class period, while the experimental group was to post their answers in blog format and comment on three other students' posts. The blogs were posted under a teacher-created forum on Moodle.com. Moodle is a free Course Management System (CMS) for educators to personalize a specific course. In this particular study, the site is accessible to students for notes, extra lab sheets, links to virtual labs, and blogs (Dougiamas, 2005). The experimental students were required to turn in their written papers as well to ensure that they completed the assignment

independently of any other students in the class. Control groups were graded for completion of written work, while experimental groups were graded on correct completion of blog posts. In order to receive full credit for correctly blogging, students had to restate the question in each of their answers and critically comment on three of their classmates' blogs.

After all data were taken, the blog criterion of the experimental group was changed – students were considered to be in the experimental group if they had blogged their constructed response answers and commented critically on one other student's blog, instead of three, due to the overwhelming number of participants who did not follow explicit instructions. For example, a student's critical comment would be considered correct if they wrote "don't forget that the ribosomes synthesize the proteins before they can be shipped out of the cell," but not if they wrote "good job." All experimental participants that did not meet the lowered criteria were removed from the experiment because they had not carried out enough of the reading task associated to blogging. Reading others' thoughts and giving feedback is a vital facet of blogging as a teaching tool (Ellison and Wu, 2008). Consequently, without this important aspect, blogging simply had not been carried out.

The pretests of each class were first compared to determine if, as a class, students started with the same level of knowledge entering each unit. The confidence level throughout the results and analysis was 95%, using a p-value of less than .05 as a determinate. Excel software was used to carry out Analyses of Variance (ANOVA) when comparing multiple groups and t-tests when comparing two groups of data.

All blogs were accessible on Moodle to all of my Biology I students at Brusly High School with a username and password. Although Moodle is accessible from home, blog writing was only completed in the library during class to ensure independent work.

All students, control and experimental, were then given an online EAGLE posttest identical to the pretest given at the beginning of each unit.

RESULTS

Pretest Comparisons

The distribution of overall pretest scores were compared with a histogram. It was determined that between 68 and 75% of the data were within one standard deviation from the mean in all three units (Figures 1, 2, and 3). Because if this calculation, an Analysis of Variance (ANOVA) was used to determine the statistically significant differences between groups throughout the study. Variances were also homogenous within each unit.

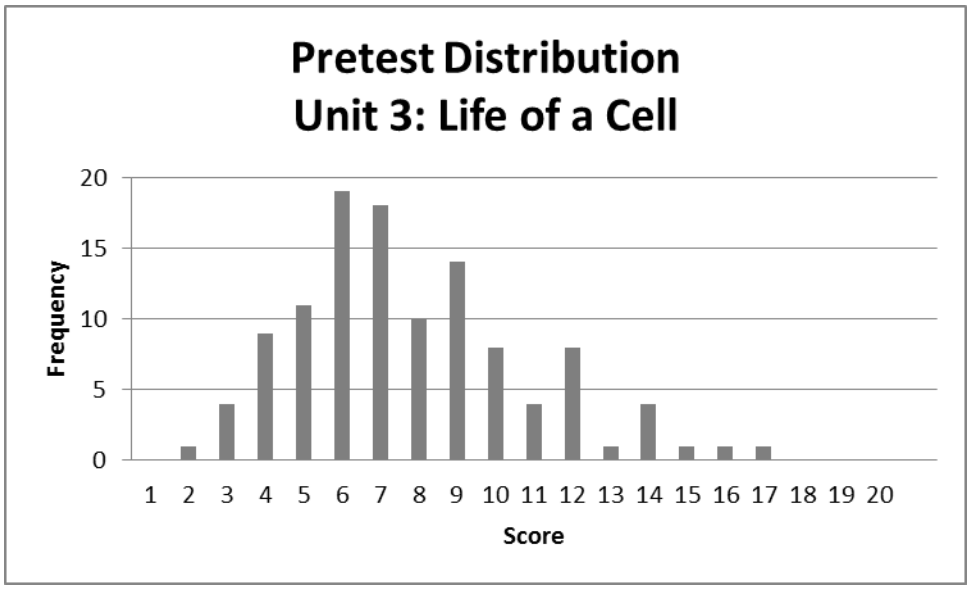

Figure 1: Unit 3 pretest distribution of scores

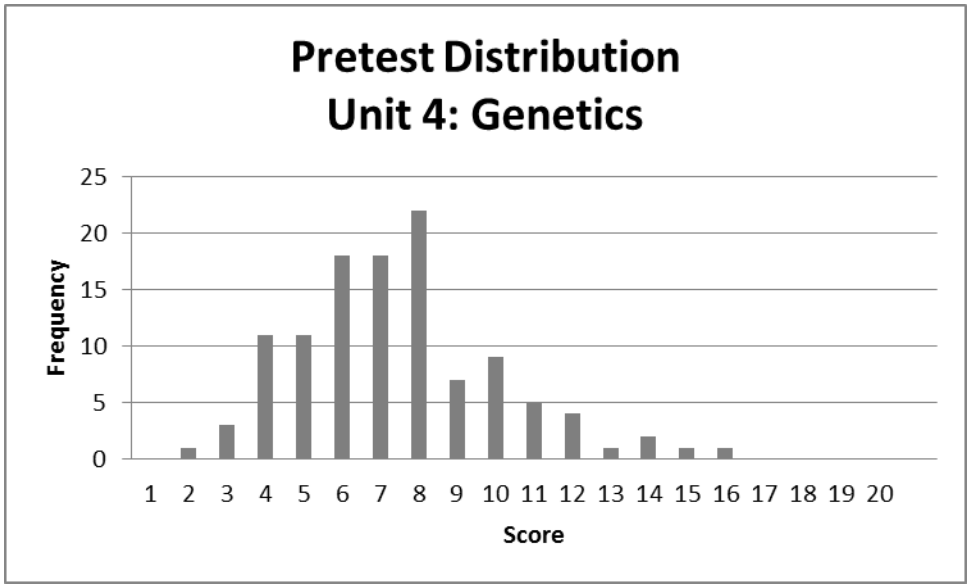

Figure 2: Unit 4 pretest distribution of scores

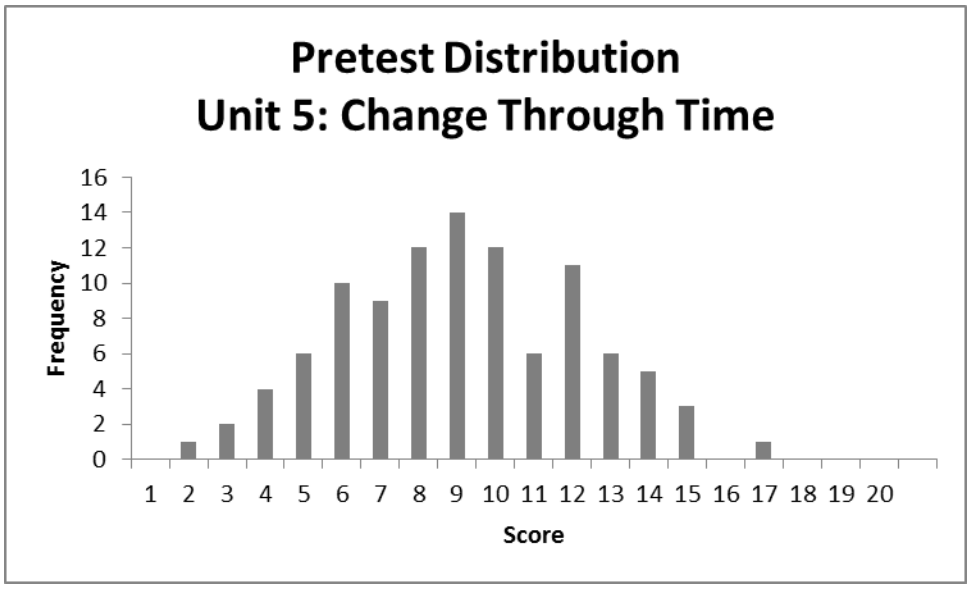

Figure 3: Unit 5 pretest distribution of scores

For all analyses throughout this paper, a confidence level of 95% was used with a p-value less than .05 as a determinate. All means are expressed with standard error. Using an ANOVA and observing the average pretest scores for each class in Unit 3, it was determined that the pretest scores of the 2 Honors classes (4^{th} and 6^{th}) in the study

were statistically different ($p = 7.9 \times 10^{-7}$, $F = 9.79$, $df = 116$) than the three Regular classes (2^{nd}, 3^{rd}, and 5^{th}) (Figure 4). After removing the Honors classes, an ANOVA determined that there was no statistically significant difference between all three Regular classes ($p = .44$, $F = .82$, $df = 60$). A similar test, Dunn's multiple comparison, was used to confirm these results. A t-test was used to determine that the 2 Honors classes were statistically similar ($p = .24$).

In Unit 4, similar results were seen with students in Honors cases scoring significant higher than students in Regular classes. ($F = 7.66$ $df = 115$, $p = 1.74 \times 10^{-5}$) when an ANOVA was run for all classes, while Honors and Regular groups were statistically similar (Figure 4).

In Unit 5, an ANOVA of the Regular classes proved that there was a statistical difference between groups, while a Tukey's multiple comparison test proved that this difference stemmed from a dissimilarity between the 3^{rd} hour and 5^{th} hour classes. Using the statistically dissimilar, but close pretest means of the two groups (3^{rd} Hour: $8.52 \pm .58$; 5^{th} Hour: $6.47 \pm .56$), the decision was made to keep the groups together (Figure 4).

These determinations drove the rest of the analysis to be done with the Honors and Regular classes separated with their respective experimental and control groups.

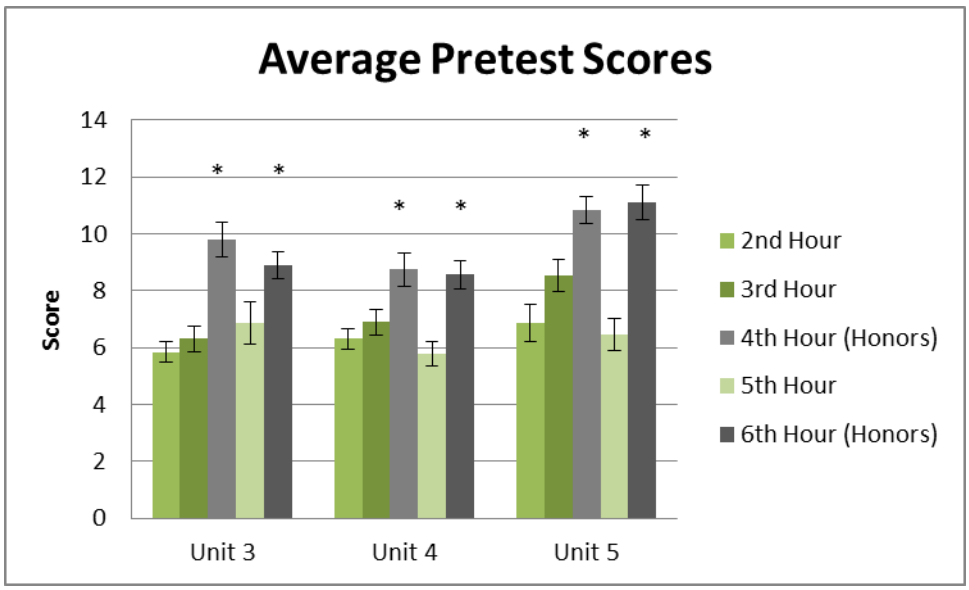

Figure 4: Pretest comparisons by class with uncertainty in the mean

The pretest averages of the control and experimental groups were then compared using t-tests to determine if each group started with the same level of knowledge entering each unit. In Unit 3, it was determined that the average pretest scores of the Honors experimental and control groups were statistically similar with a mean score of 9.22±.66 for the experimental group and a mean score of 9.34±.46 for the control group ($p = .87$). It was also determined that the average pretest scores of the Regular experimental and control groups were statistically similar with a mean score of 7.00±.85 for the experimental group and a mean score of 6.12±.34 for the control group ($p = .23$).

In Unit 4, statistically significant difference was seen between the Honors experimental and control groups with a mean score of 7.65±.49 for the experimental group and a mean score of 9.43±.55 for the control group ($p = .02$). There was no statistically significant difference between the Regular experimental and control groups

with a mean score of 7.00±.67 for the experimental group and a mean score of 6.15±.30 for the control group (p = .22).

In Unit 5, there was a significant difference between Honors experimental and control groups with a mean score of 11.8 ±.54 for the experimental group and a mean score of 10.34±.46 for the control group (p = .04). There was no statistical difference between the Regular experimental and control groups with a mean score of 7.44±.80 for the experimental group and a mean score o 7.63±.43 for the control group (p = .85).

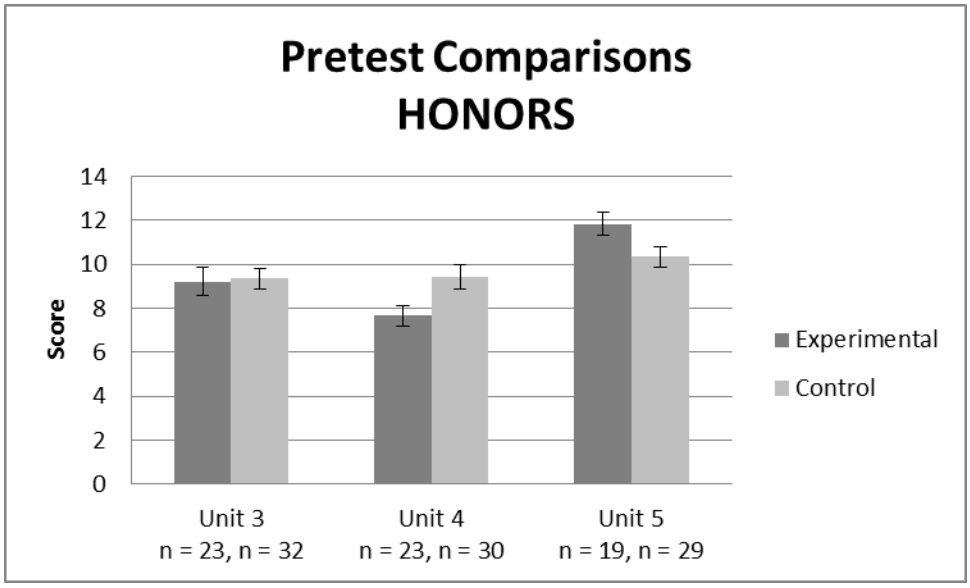

Figure 5: Pretest comparisons of honors experimental and control groups with uncertainty in the mean

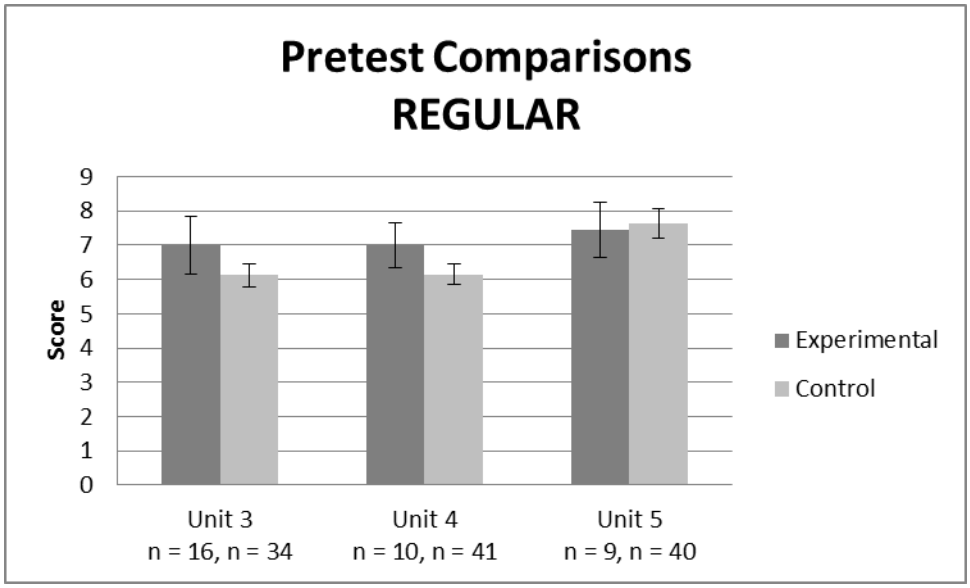

Figure 6: Pretest comparisons of regular experimental and control groups with uncertainty in the mean

Initial Gain Comparisons

The raw gains (posttest score – pretest score = raw gain) of the experimental and control groups were then compared to determine if more knowledge was attained by students who participated in blogging versus those students who turned in written answers. The raw gains of Honors experimental and control were first compared, then the raw gains of Regular experimental and control. In Unit 3, no significant differences were seen between experimental and control groups in Honors with a mean gain of 5.09±.71 for the experimental group and a mean gain of 4.71± .53 for the control group ($p = .67$). There was no significant difference between Regular experimental and control groups with a mean gain of 2.81± 1.05 for the experimental group and a mean gain of 2.03± .67 for the control group ($p = .52$).

In Unit 4, no statistically significant difference was seen between experimental and control groups in Honors with a mean gain of 4.57± .63 for the experimental group

and a mean gain of 2.9± .66 for the control group (p = .08). There was no significant difference seen between Regular experimental and control groups with a mean gain of 2.00± .95 for the experimental group and a mean gain of 1.85±.38 for the control group (p = .87).

Unit 5 also showed no significant difference between experimental and control groups in Honors with a mean gain of 1.95±.73 for the experimental group and a mean gain of .76±.53 for the control group (p = .19). There was no significant difference seen between Regular experimental and control groups with a mean gain of 1.56±.63 for the experimental group and a mean gain of .55±.47 for the control group (p = .34).

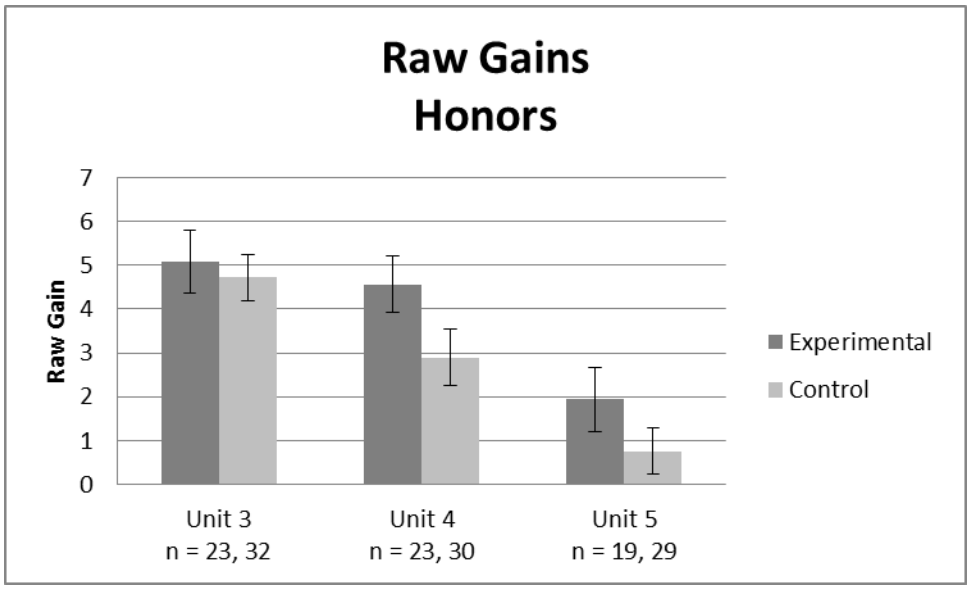

Figure 7: Raw gain comparisons of honors experimental and control groups with uncertainty in the mean

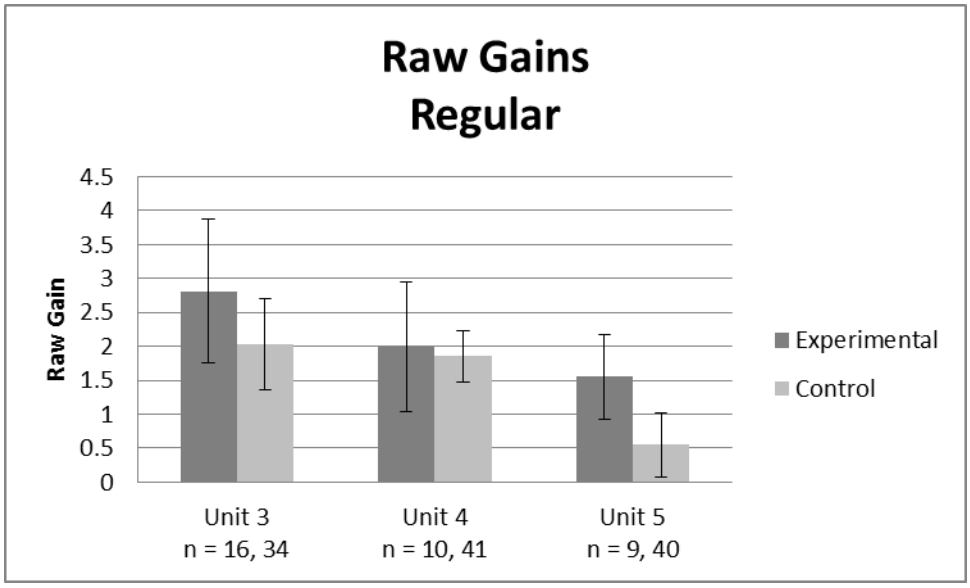

Figure 8: Raw gain comparisons of regular experimental and control groups with uncertainty in the mean

Gain Comparisons by Gender

To further tease out possible differences in gains, comparisons were made between male and female bloggers. Again, Honors and Regular classes were kept separate due to the statistically significant differences in the initial analyses of pretest scores.

An ANOVA was used to test the differences in groups, separated by gender. The analyses were run comparing experimental and control males and females together. In Unit 3 there were no significant differences between Honors males or females ($p = .16$, $F = 1.81$) (Figure 9). No significant differences ($p > .05$) were seen with the Honors gender breaks in Units 4 ($p = .26$, $F = 1.37$) (Figure 11) or 5 ($p = .23$, $F = 1.51$) (Figure 13).

An ANOVA was also used to run similar comparisons for gender separations of Regular classes. In Unit 3 there were also no significant differences between Regular males or females ($p = .66$, $F = .54$) (Figure 10). No significant differences were seen with

the Regular gender breaks in Units 4 (p = .39, F = 1.03) (Figure 12) or 5 (p = .54 ,F = .72) (Figure 14) .

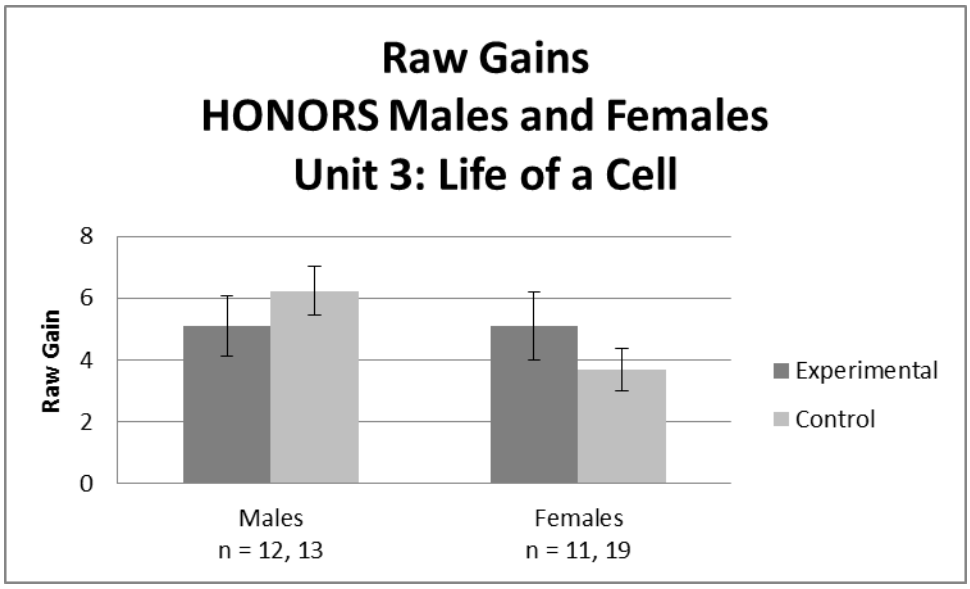

Figure 9: Unit 3 gain comparisons by gender for honors with uncertainty in the mean

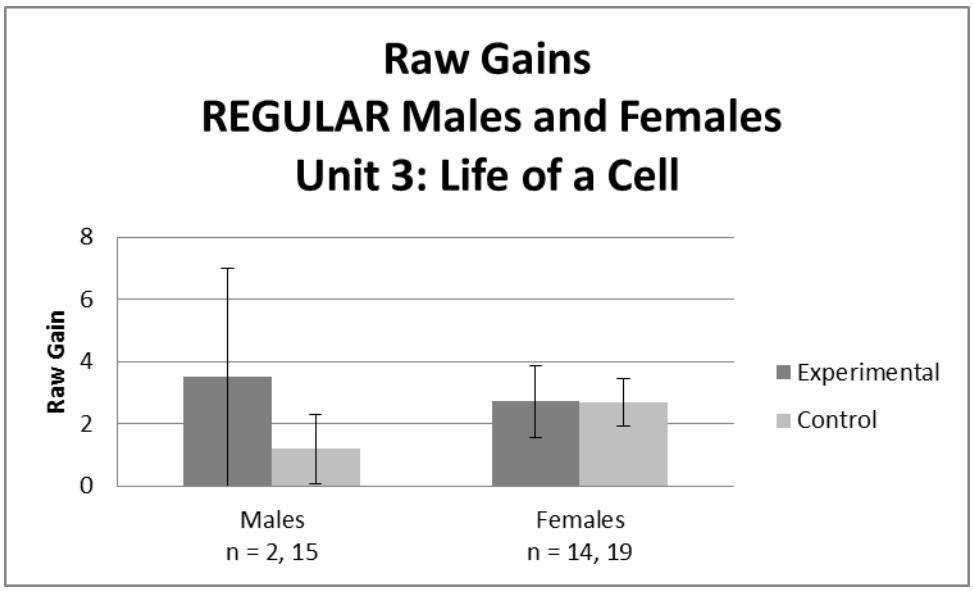

Figure 10: Unit 3 gain comparisons by gender with uncertainty in the mean

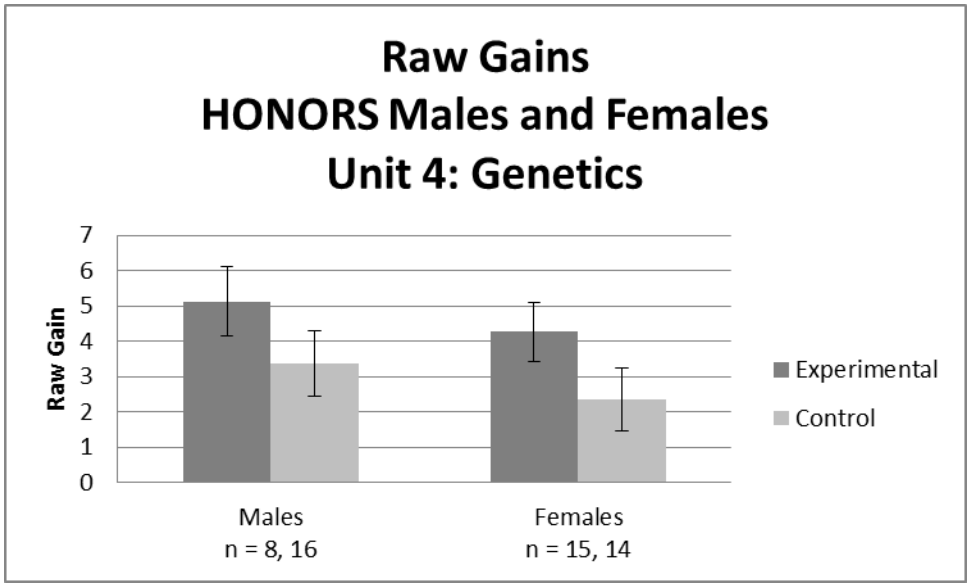

Figure 11: Unit 4 gain comparisons by gender with uncertainty in the mean

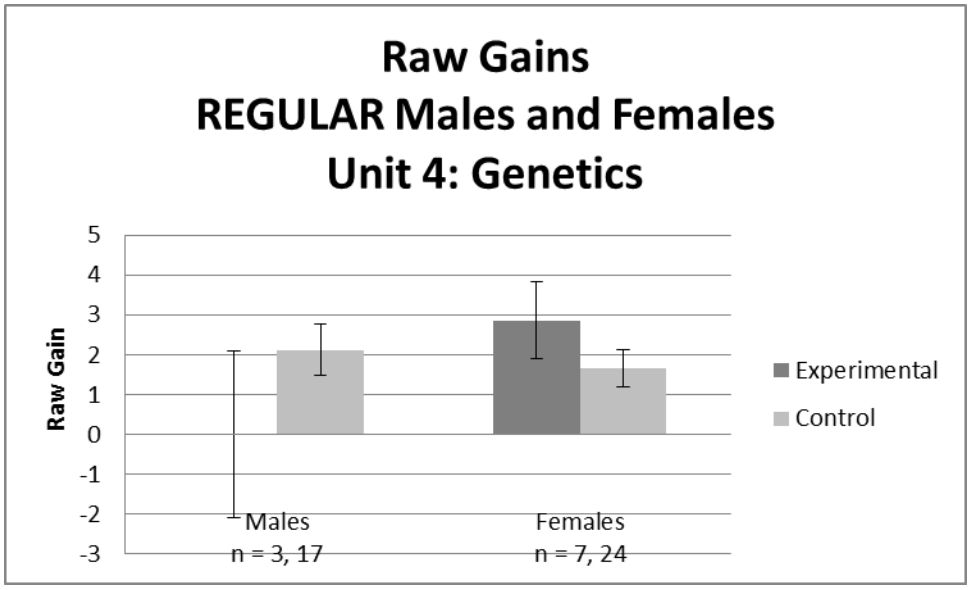

Figure 12: Unit 4 gain comparisons by gender with uncertainty in the mean

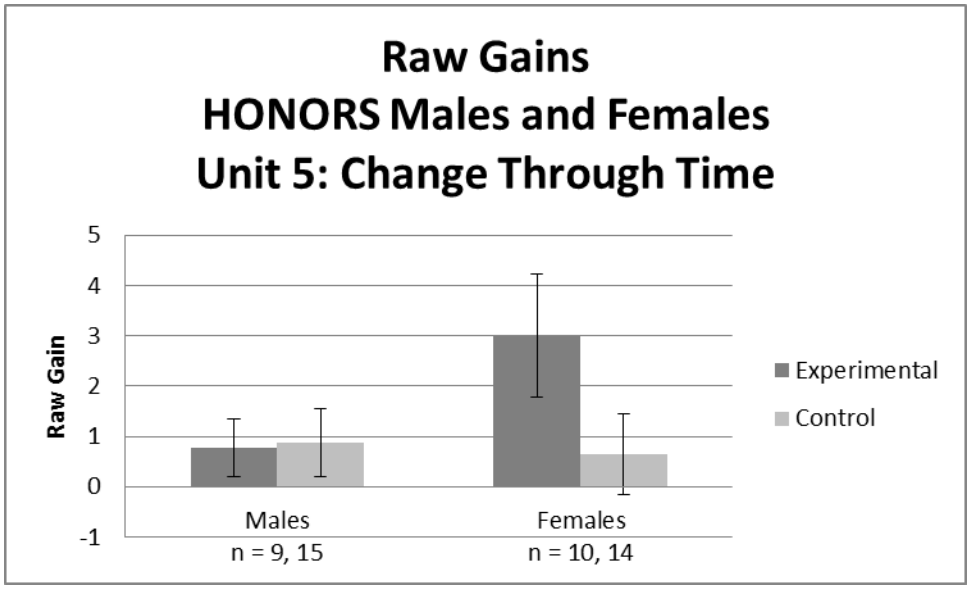

Figure 13: Unit 5 gain comparisons by gender with uncertainty in the mean

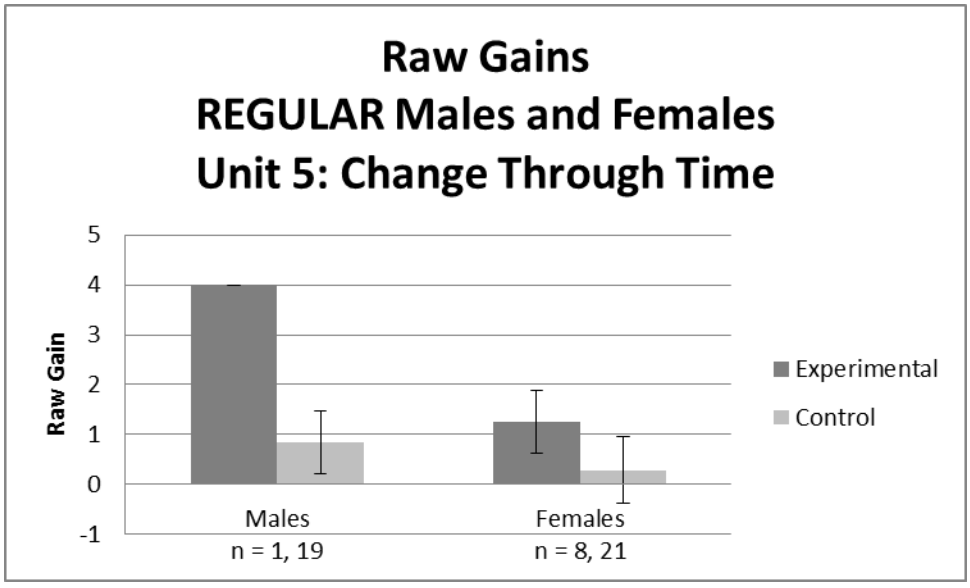

Figure 14: Unit 5 gain comparisons by gender with uncertainty in the mean

Gain Comparisons by LEAP Scores

Comparisons were then made between experimental and control groups using achievement levels earned on the Louisiana Educational Assessment Program (LEAP) English Language Arts (ELA) test. Students scored within 5 achievement levels based on

their numeric score: Advanced (402 – 500), Mastery (356 – 401), Basic (315 – 355), Approaching Basic (269 – 314), Unsatisfactory (100 – 268). A significant difference was seen between control and experimental groups in Units 4 and 5, while no significant differences were seen in Units 3 (Figure 15). In Unit 4, students who scored Mastery on the LEAP showed a significant difference between experimental and control groups (p = .046) (Figure 16). In Unit 5, students who scored Advanced on the LEAP showed a significant difference between experimental and control groups (p = .037) (Figure 17).

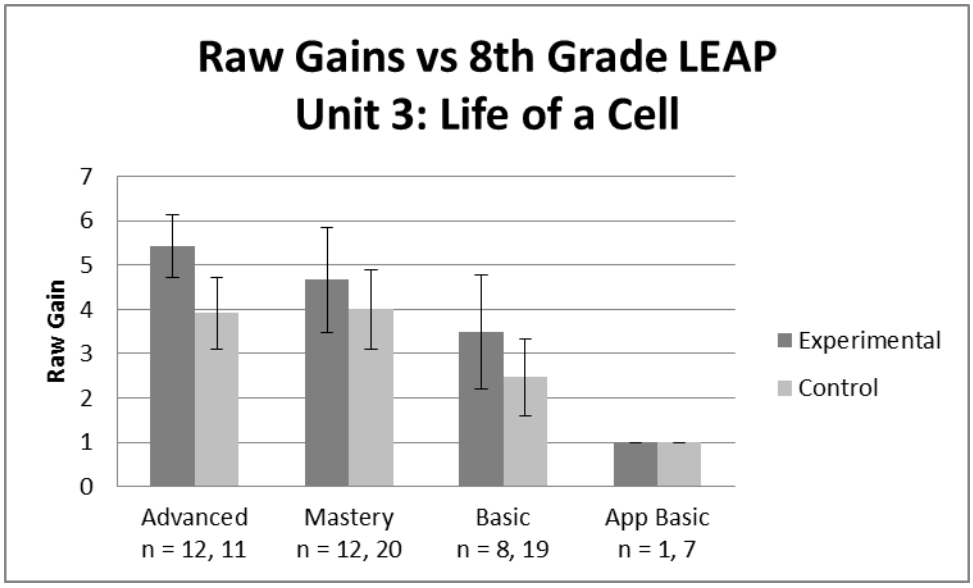

Figure 15: Unit 3 comparisons of raw gains and 8th grade LEAP scores with uncertainty in the mean

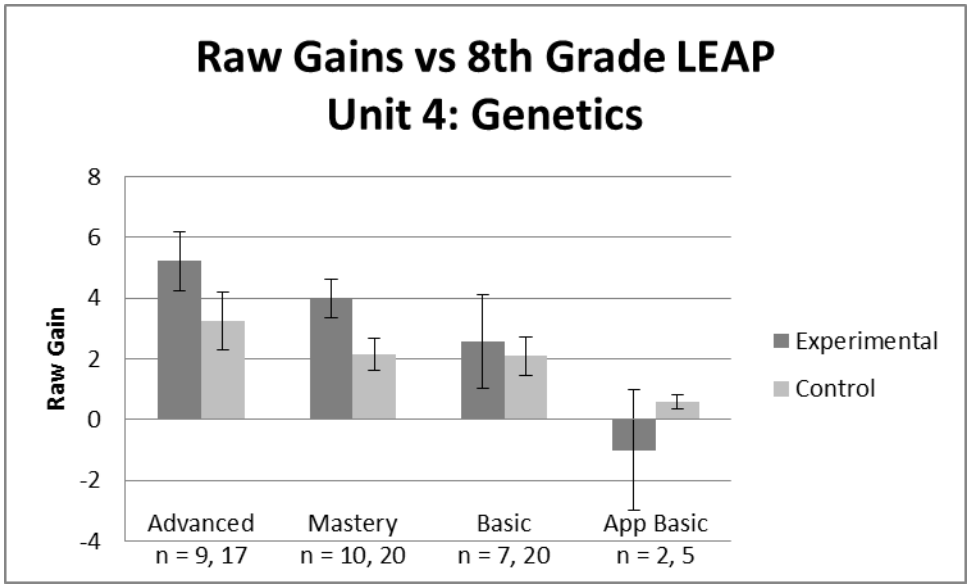

Figure 16: Unit 4 comparisons of raw gains and 8th grade LEAP scores with uncertainty in the mean

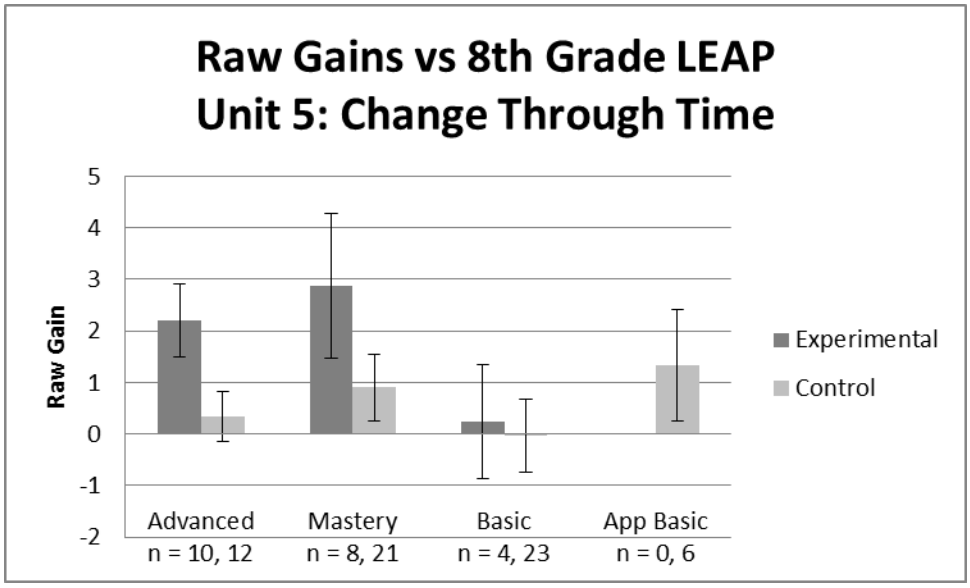

Figure 17: Unit 5 comparisons of raw gains and 8th grade LEAP scores with uncertainty in the mean

Correct Blogging by LEAP Scores

Comparisons were also made to determine if LEAP English Language Arts (ELA) scores affected the percentage of students who followed directions in the blogging

assignment. It was observed that as LEAP scores decreased, the percentage of students assigned who actually followed directions and blogged correctly decreased (Figure 18). For example, in Unit 3, of 16 advanced students assigned to blog, about 81% of them correctly blogged according to the updated criteria, which required students to blog their constructed response answers and critically comment on one student's blog. The percentages decreased steadily with 79% of mastery students, 53% of basic students, and 25% of approaching basic students who blogged correctly.

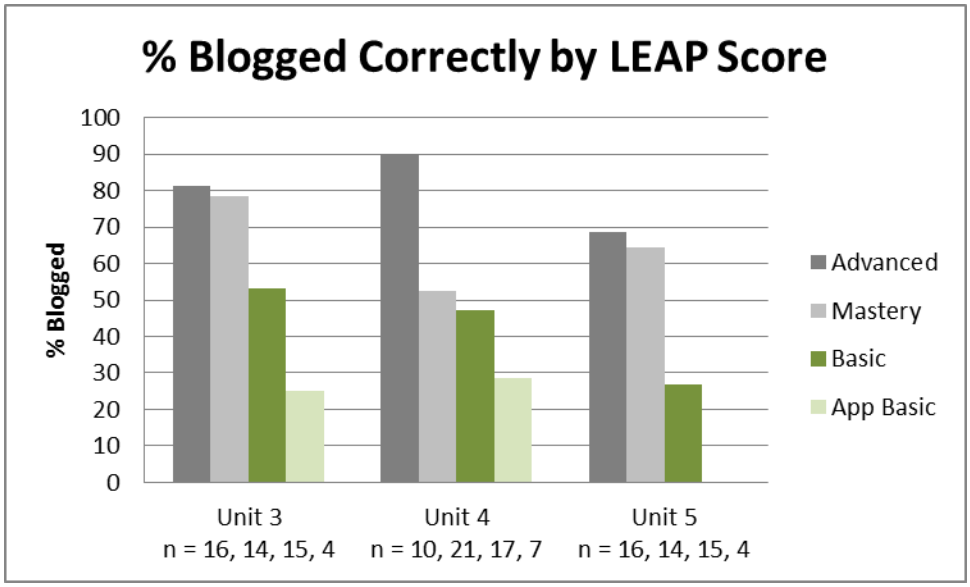

Figure 18: Comparison of students who blogged correctly by LEAP score

DISCUSSION AND CONCLUSION

The purpose of this research project was to discover the effect of student blogging in a high school Biology classroom on raw gains from unit pretest to posttest. Other studies have shown the effects of undergraduate blogging on posttest scores (Tekinarslan, 2010), the correlation of undergraduate blogging on exam scores (Du and Wagner, 2005), undergraduate and graduate blogging on student's perception of helpfulness (Davi *et al.,* 2007), and undergraduate blogging and written work on student's perception of helpfulness (Ellison and Wu, 2008). Because students are required to take state-mandated, end-of-course tests in Biology as a final exam grade and to graduate, it is beneficial to learn techniques that thoroughly engage them enough to increase test scores.

In the present study, analyses were done comparing raw gains of students who blogged about Biology I topics and those who simply answered questions on the same topics. Factors that were also examined were class level (Honors and Regular), gender, and LEAP English Language Arts (ELA) levels. Honors students are recommended by previous teachers as well as parent requests. LEAP ELA levels are based on writing, information resources, reading/responding, and proofreading (Louisiana Department of Education, 2011).

No overall significant differences or trends were found in the learning gains of the experimental group of students (bloggers) and the control group (nonbloggers) before any subgroups were analyzed. The lack of significant gains is likely due to the maturity level of the students in this study. Studies showing significant gains or

perceived significant gains used undergraduate or graduate level college students with likely higher maturity levels and a raw desire to learn (Tekinarslan, 2010; Du and Wagner, 2005; Davi *et al.,* 2007; Ellison and Wu, 2008). Though it is likely some students did put an immense amount of effort into their blogs and took the pretests and posttests seriously, others often made negative gains due to not reading questions or guessing on the pretests and posttests. The negative gains were enough to cancel out possible significant gains made by the experimental groups. Bonus points were given as a precaution to uphold the amount of effort given, but in classes of 9th and 10th grade students, controlling the amount of effort given is nearly impossible.

No significant difference was found in the learning gains of experimental and control males or females. Again, the maturity levels of the males and females in this study were not as high as similar studies showing significant differences in undergraduate courses (Tekinarslan, 2010).

One significant difference was found when comparing ELA scores from LEAP tests taken in 8th grade. These were the most recent standardized reading scores available for each student, and they were used as a comparison due to the nature of the blogging assignment, which was essentially a reading and writing assignment. In Unit 5, the advanced group showed a statistically significant higher mean in the experimental groups. Because no pattern was evident in the few positive results during the analysis of this study, it cannot be explicitly stated that blogging is the only factor contributing to the success of the experimental groups.

During blogging assignments students were diligent about working through their own misconceptions, and were more attentive to their own learning because of this. One of the original motivational factors for this project was an awareness of the need to increase student accountability for their own learning. In regards to student accountability, blogging was definitely a positive attribute.

In future studies with blogging in high school, it would be beneficial to afford students more opportunities to practice and perfect blogging. Showing students the depth of their classmates writing in comparison to their own would likely bring lower writing students up to their peers' level.

It would also be interesting to see how upperclassmen perform with this same blogging activity. This study was implemented with ninth and tenth grade students ranging from ages thirteen to fifteen. While some took the act of blogging and critiquing seriously, others seemed to rush through or simply not critique at all. In a grade level with students closer to attending college, significant gains may be seen more commonly due to the ability to critique the work of others in a more mature manner.

Though no statistically significant gains were seen between experimental and control groups, it should be noted that the effort given by the experimental students was often higher than students in the control group. For example, when all students were assigned to work independently (using only their textbook and notes) during one class period on constructed response questions, students in the experimental group would often ask to explain their answers before writing them. Based on experiences with high school students, it is likely that experimental students were more conscious

and concerned about critiques from their peers than the control students who would only receive critiques from the teacher. Based on the experiences throughout this research, with minimal changes to accommodate the study group, blogging can be an engaging and beneficial teaching tool in a high school classroom.

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APPENDIX A: PRETEST SCORE COMPARISONS

P-Values Comparing EAGLE Pretest Scores			
	Unit 3	**Unit 4**	**Unit 5**
All Classes	7.90×10^{-7}	1.74×10^{-5}	1.94×10^{-6}
2nd Hour	.444	.163	.034*
3rd Hour			
5th Hour			
4th Hour	.238	.824	.713
6th Hour			

Pretest Comparisons (P-values) Experimental vs. Control			
	Unit 3	**Unit 4**	**Unit 5**
Honors	.872	.024*	.043*
Regular	.234	.219	.855

APPENDIX B: RAW GAIN COMPARISONS

Raw Gain Comparisons (P-values) Experimental vs. Control			
	Unit 3	**Unit 4**	**Unit 5**
Honors	.674	.080	.185
Regular	.520	.870	.335

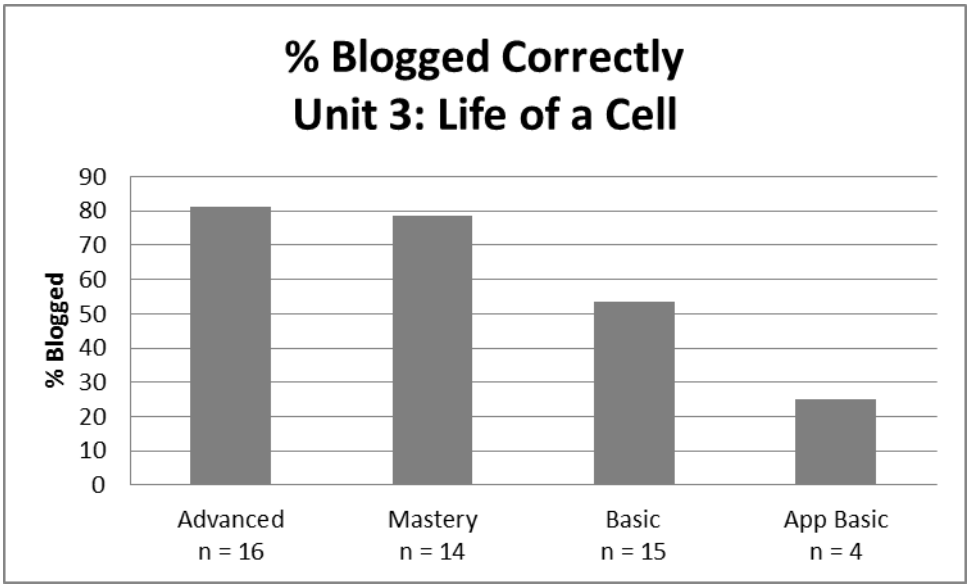
APPENDIX C: RAW GAIN COMPARISONS BY GENDER

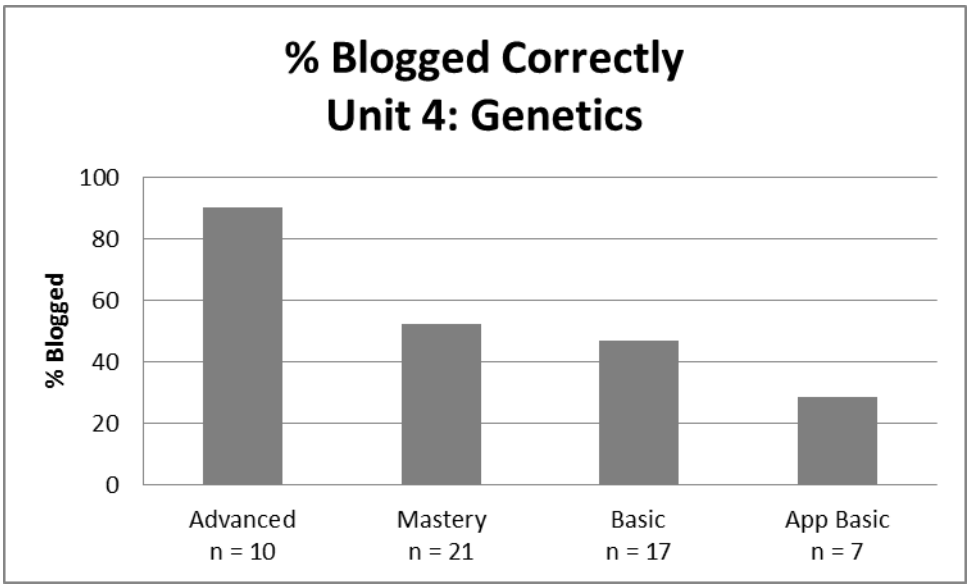
Raw Gain Comparisons by Gender (P-values) Experimental vs. Control			
	Unit 3	**Unit 4**	**Unit 5**
Honors	.156	.262	.225
Regular	.658	.388	.544

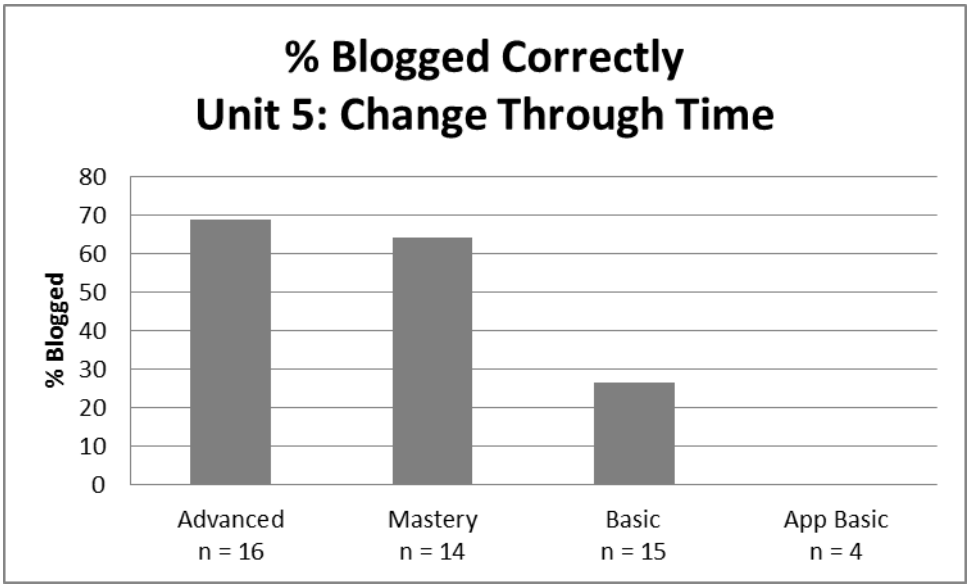
APPENDIX D: RAW GAIN COMPARISONS BY LEAP SCORE

Raw Gain Comparisons by LEAP Scores (P-values) Experimental vs. Control			
	Unit 3	**Unit 4**	**Unit 5**
Advanced	.161	.198	.037*
Mastery	.656	.046*	.156
Basic	.525	.744	.870
Approaching Basic	-	.218	-

APPENDIX E: STUDENTS WHO BLOGGED CORRECTLY BY LEAP SCORE






% Blogged Correctly
Unit 5: Change Through Time
% Blogged
80
70
60
50
40
30
20
10
0
Advanced
n = 16
Mastery
n = 14
Basic
n = 15
App Basic
n = 4

APPENDIX F: TABLE OF ALL COMPARISONS ANALYZED

P-Values of Raw Gains Bloggers (Experimental) vs. Nonbloggers (Control)			
	Unit 3	**Unit 4**	**Unit 5**
Honors	.674	.080	.185
Regular	.520	.870	.335
Males (H)	.340	.262	.931
Females (H)	.256	.132	.113
Males (R)	.507	.234	-
Females (R)	.982	.245	.423
LEAP: Advanced	.161	.198	.037*
LEAP: Mastery	.656	.046*	.156
LEAP: Basic	.525	.744	.870
LEAP: App Basic	-	.218	-

APPENDIX G: EXAMPLES OF STUDENT WORK

response blog yay
by Emily Palermo - Friday, 4 November 2011, 06:34 AM

1. The role of a nucleus is similar to that of a captain on a team because the nucleus is in charge of the cell's functions, just as a captain in in charge of what his teammates do.
2. The reactants of photosynthesis are carbon dioxide, water, and sunlight, and the products are glucose and oxygen.
3. Both contain the same elements and compounds, but the reactants of cell respiration are the products of photosynthesis, and vice versa.
4. Ribosomes, the rough ER and the golgi apparatus would be involved in the production and secretion of enzymes.
5. The cells, which had previously been indnted on both sides would shrivel up beause water would move out of the cell, and there would be more salt than free water molecules in the cell.
6. The company shouldn't because there would be more solute than liquid, and that would not quench thirst.

The end.

Edit | Delete | Reply

Re: response blog yay
by JANAE OVETE - Friday, 4 November 2011, 06:37 AM

1. Also the nucleus has dna so it somewhat makes up the cell.

Show parent | Edit | Split | Delete | Reply

Re: response blog yay
by ANNA ROGERS - Sunday, 6 November 2011, 04:58 PM

Emily, this is very informative.

Show parent | Edit | Split | Delete | Reply

unit 4: Constructed Response!
by Jordan LeBlanc - Tuesday, 10 January 2012, 03:15 PM

1. Human cultures have laws against marraiges between close relatives because the mother and the father of the child both have the recessive allele for the same trait, because they are so closley related, this gives the child a higer chance of being born with the lethal allele.

2. The complimentary strand of the DNA sequence GGCAGTTCATGC is CCGTCAAGTACG.

3. It is important to have a signal that stops translation because if the codons keep forming, they could make an unnecessary amino acid or an improperly made amino acid and if it is not made properly, it will not function properly.

4. No, this man cannot be the father because both parents would pass down the recessive alleles for this trait, so the child would have a 100% chance of having attatched earlobes if this was his child.

5. This man could only be the father of the child with type A blood because he and his wife would only be able to produce a child wiht type A, B, or type AB blood, therefore the child wiht type O blood is not his.

6. The steps used when scientists insert a gene into another organism using recombiant DNA would use the same restriction enzyme on both of the genes so that they will match up exactly, which makes the ends become "sticky", and are able to stick to the end of each gene, then the gene would be inserted into a bacteria cell.

Edit | Delete | Reply

Re: unit 4: Constructed Response!
by JOSEPH FISHBURN - Wednesday, 11 January 2012, 02:14 AM

5. The parents dont have an i allele to give up.

Show parent | Edit | Split | Delete | Reply

Blogging!
by [redacted] - Tuesday, 17 April 2012, 10:58 AM

4) The connection Darwin made between the Galpagos tortoises and their environments were the different types of shell shapes were found among the different habitats that the shell corresponds to.

10) The accounts for the presents of marine fossils on mountain tops were Charles Darwin saw on earth awake in South America. While the earthquake was occuring, the shoreline of the ocean water shifted up to make a small mountain while sea animals were holding and hugging onto the mountain.

21) Charles Darwin explained the long legs of the water bird in Figure 16-6 by saying waterbirds needs long legs in order to move around in deep parts of water. By having long legs this will allow the water birds to pass it off to their offspring.

31) This physicological similarity indicate about the revolution, history of vertebrates is they get around easier without a backbone, and it passes on to their offspring as well.

9) The mutations that has the greater potential to affect the evolution is the 300 different mutations that take a huge part of the different DNA between you and your parents.

21) No, genetic drift has not occured after a while because of series of changed situations can cause an allele to become more or less popular in a certain population.

27) A hypothesis that states and explains how the new species may have originated by the different DNA strands, alleles, and traits that species had, and the different shapes of the plant made each species form differently.

30) They gain an extra chromosome in Meiosis.

Edit | Delete | Reply

Re: Blogging!
by [redacted] - Tuesday, 17 April 2012, 11:42 AM

Yuh Answered the questions Good But Yuh Could have answered with more details but overall good job.! :)

Show parent | Edit | Split | Delete | Reply

Re: Blogging!
by [redacted] Tuesday, 17 April 2012, 11:47 AM

You did very well with these answers but may have needed a bit more detail. For example, on question number 4, you may have wanted to explain how the shells differed in each environment. Also, on the first number 21, your explanation sounds more like Lamarck's theory than Darwin's. You also needed to write how it compared to Lamarck's theory.

Show parent | Edit | Split | Delete | Reply

APPENDIX H: INSTITUTIONAL REVIEW BOARD APPROVAL FORM

Application for Exemption from Institutional Oversight

Institutional Review Board
Dr. Robert Mathews, Chair
131 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.6792
irb@lsu.edu
lsu.edu/irb

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/ projects using living humans as subjects, or samples, or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

– Applicant,Please fill out the application in its entirety and include the completed application as well as parts A-E, listed below, when submitting to the IRB. Once the application is completed, please submit two copies of the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at http://www.lsu.edu/screeningmembers.shtml

– A Complete Application Includes All of the Following:
(A) Two copies of this completed form and two copies of part B thru E.
(B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)
(C) Copies of all instruments to be used.
*If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.
(D) The consent form that you will use in the study (see part 3 for more information.)
(E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB. Training link: (http://phrp.nihtaining.com/users/login.php.)
(F) IRB Security of Data Agreement: (http://www.lsu.edu/irb/IRB%20Security%20of%20Data.pdf)

1) Principal Investigator: Dana Browne **Rank:** Professor

Dept: Physics & Astronomy **Ph:** (225) 578-6843 **E-mail:** phowne@lsu.edu

2) Co Investigator(s): please include department, rank, phone and e-mail for each

Mandy LeBourgeois, MNS Graduate Student
(225)229-8809
mandylebourgeois@gmail.com

IRB# E5605 LSU Proposal #
(X) Complete Application
(X) Human Subjects Training

3) Project Title: Technology in the Classroom: Effect of Student Blogging on Learning Gains

Study Exempted By:
Dr. Robert C. Mathews, Chairman
Institutional Review Board
Louisiana State University
203 B-1 David Boyd Hall
225-578-8692 | www.lsu.edu/irb
Exemption Expires: 8-17-2014

4) Proposal? (yes or no) NO **If Yes, LSU Proposal Number**

Also, if YES, either ◯ **This application completely matches the scope of work in the grant**
OR ◯ **More IRB Applications will be filed later**

5) Subject pool (e.g. Psychology students) High School Biology I Students

*Circle any "**vulnerable populations" to be used**: (children <18, the mentally impaired, pregnant women, the ages, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature Dana Browne **Date** 6/30/11 (no per signatures)

** **I certify my responses are accurate and complete.** If the project scope or design is later changes, I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Action: Exempted √ Not Exempted ____ Category/Paragraph 1

Reviewer Mathews **Signature** Robert C Mathews **Date** 8/18/11

VITA

Mandy Lynn LeBourgeois was born on Thanksgiving Day, November 1986 in Lafayette, Louisiana. She attended primary and secondary schools in Saint Mary Parish and graduated from West Saint Mary High School in 2004. She attended Louisiana State University where she graduated with her Bachelor of Science degree in Biological Sciences in 2008. Mandy entered the Louisiana State University Graduate School in May 2010 to pursue a Master of Natural Sciences degree. She is currently teaching Biology at Brusly High School in West Baton Rouge Parish.