Cool Communication: Blogging with the Teacher

A Thesis Presented to

The Faculty of the Education Program

California State University Channel Islands

In (Partial) Fulfillment

of the Requirements for the Degree

Master of Arts

Special Education

by

Kristin Sue Haidet

May 2010

APPROVED FOR THE SCHOOL OF EDUCATION

6-23-2010

Dr. Merilyn C. Buchanan **Date**

APPROVED FOR THE UNIVERSITY

Joan M. Karp 6/23/10

Dr. Joan M. Karp **Date**
Senior Associate Dean
Director of the School of Education

Abstract

This action research project set out to discover if using on-line blogging with eighth grade special education students would help develop their feelings of self-efficacy, increase motivation, and consequently raise their academic achievement in math. Blogging replaced some weekly paper and pencil homework assignments. A further line of inquiry was to see if there was a change in the existing unsatisfactory rate of homework completion. Findings indicate that instead of communicating through the blogs, blogging itself became a topic of conversation between the students. While homework completion rates did improve, it could not be determined if this was attributed to the blogging project. Although students' enjoyed the project, excuses for non-completion of homework continued and access to computers was an issue.

Acknowledgements

Without the support of several remarkable people, I would not have been able to have the success in my teaching career that I have had up until this point in my life. To be able to complete a Masters degree is such a difficult and rewarding achievement and I am blessed to have these people in my life. My tremendous gratitude and love for these people are endless.

First, I would to thank my dad, who has always supported me and encouraged me to be the best I can be. He always expressed his pride in me to everyone. Because of his hard work, love and financial support I was able to accomplish this dream. His example, knowledge, and advice helped me understand how to be a better person. He has always been very dedicated and hard working, which I have looked up to. He believed in me and I am so grateful for all of his support throughout the years. I strive to be the best I can be everyday because of you. Thank you dad!

To my mom, who has always been there for me whenever I needed anything. My mom would do or give anything to make me happy. She has shown me how to be kind and loving, and looking up to her example has helped me to become the woman I am today. Without her love and support, I would not be successful in life. Although she has not been present to witness these accomplishments, she is in my heart. Thank you mom!

To my husband, Christopher Haidet, who had to endure the crazy school schedules and supported the ups and downs throughout my education. He kept me relaxed when I was completely stressed and picked up where I left off. Chris is a person who knows and understands me while accepting me for who I am. He knows how to put things into perspective and helps me figure things out. He has always been a shoulder to lean on. He listens to me, comforts me, guides me and makes me laugh. I have the best husband in the world and would do anything for him. Without his encouragement and love I would not have been able to get through this. I love you so much and appreciate everything you do, I couldn’t have done this without you!

To my mother in-law, Sue Haidet, who has encouraged and supported me through this process. Thank you for proofing my papers and offering guidance when needed. I appreciate all you have done for me and thank you for encouraging me to finish!

I would like to acknowledge all of the incredible educators that have helped me on my path to becoming a teacher. To all my CSUCI professors: for helping and guiding me, to become a wonderful teacher.

To my former math teacher and principal Craig Nicks for taking a chance on me and giving me a job in Special Education. To Yanka Ricklefts, my former mentor, and her amazing support as I interned my way to a special education credential. You taught me what I know about teaching students with special needs. I would also like to thank my friend and colleague Lena Layman for being there to guide and support me with awesome advice, an extra pair of eyes, and for helping me with the surveys for this thesis. I would have had a tough time without you wonderful ladies!

Finally, I would like to thank my Masters advisor, Dr. Merilyn Buchanan, for coaching me through all the necessary steps of completing a thesis paper with such nurture and care. Not only has Dr. Merilyn Buchanan been my Master advisor she has been my mentor, and professor. First, she was my math professor during my multiple subject credential program and it has been a pleasure working with her again, I couldn’t think of anyone I would rather work with on this thesis. Dr. Merilyn Buchanan, you are a wonderful teacher whose enthusiasm for teaching math is contagious. You have given me the confidence I needed to step foot in a math class and the tools to create wonderful hands-on lessons. Your expertise in teaching and your style and passion for math has been infectious and I hope I teach with as much excitement and enthusiasm as you have demonstrated throughout the years. You, have made an impact in my life and have helped to mold me into the teacher I am today. Thank you for all the wisdom and expertise you have shared with me during my education and this process. I appreciate everything you have done for me in helping me make this dream a reality. I thank you for of your support and encouragement throughout the thesis and my whole career.

In addition, I would like to thank my students who have been there with me on this long journey, I am truly grateful!

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Chapter I

Introduction

This study examines if middle school students with special needs become more motivated during Mathematics instruction as a result of using web logs, otherwise known as blogs, as a means for communicating their mathematical ideas and solutions with the teacher and each other. This chapter provides the reader with a foundation for understanding how and why this study was developed, presents the three research questions, and provides an overview of the research.

Theoretic Background to the Study

Recent advances in communications technology have made it possible for large numbers of people everywhere to interact in ways that were never before possible. By connecting to the Internet via computers, users can now send public and private messages stating their views on a wide range of topics and by using a variety of different communication tools. This form of user interaction is no longer limited by geographic boundaries, race, gender, disability, or other traditional limitations to communication.

In the past the advent of technologies such as the printing press, radio, telephone, and television significantly changed school systems, how teachers delivered instruction, and the way students learned and were held accountable for their learning. The current technological advances associated with the Internet are already impacting learning and instruction and may further change our school systems and structures in ways that today cannot be imagined.

In 1995, the Choices and Challenges Project at Virginia Tech held a forum to explore the ways computer network technologies could significantly alter traditional patterns of human existence. Doris Zallen, Director of the Choices and Challenges Project, described the results of that forum.

According to participants, the U.S. government and many businesses had begun to actively promote the development of a telecommunications infrastructure that was envisioned to make electronic communities a possibility--indeed common--by the year 2010. The creation of fiber-optic networks, designed to make large amounts of information easily available to individuals and institutions, was regarded by many as the necessary mechanism for advancing the quality of life in American society. According to Zallen (1995), "These new forms of communication and information exchange are certain to have revolutionary effects on education, the workplace, government, health care, social interaction--on nearly every aspect of human life and thought" (p.1). It is fifteen years since those statements were made, and while the information exchange element of the technologies has found its place in schools we are less well-informed about the effect of the communication aspects. This study represents an exploration of the effect of one communication technology in an educational setting.

Literature Review

The review of the literature focused on examining what is known about advances in communication technology in relation to its effects on schooling. Specifically, the literature review focused on the impact of personal computers on mathematics classrooms as well as how one computer aided communications technology, blogging, evolved and changed classroom communication. The literature indicated that infusing technology is a more effective way of teaching, the expectancy that learners will be motivated by technology, self-efficacy will be increased, and independent learning fostered, while providing a safe and open classroom space where students' voices can be heard and in which student centered learning takes priority. Literature connecting the concepts of effective learning and instruction with technology were also reviewed.

Statement of the Problem

After looking at students' grades and homework results, it became evident that many students within a specific math group were neither completing homework assignments nor making a connection out of school with classroom learning activities. The same individual students regularly appeared to have difficulties with homework completion. Overall, the group members had poor self-concept and did not regard themselves as competent mathematics learners. The teacher-researcher began to ask the questions: Are these students motivated to learn? What can be done to increase their motivation and boost their self-concept? Additional to these teacher contemplations, students requested having access to each other through blogging. This request combined with the teacher's desire to improve her practice, gave impetus to the idea of using weblogs in homework assignments as a vehicle for inter-group communication.

It was anticipated that by using technology that was familiar to them, i.e., blogging, as a means of communicating their mathematical ideas, understandings and solutions with the teacher and with each other, the group of students would be more motivated to complete homework tasks, and hence improve their course grades, as well as provide the opportunity to develop their academic language. In was also assumed that as a consequence of increased motivation and participation, the students would begin to feel more confident, and that the increased self-efficacy would lead to increased competency.

The teacher-researcher decided to formalize inquiry into her practice and the potential value of weblogs by embarking on an Action Research project. The participant-learners were a group of nine eighth grade students with special needs who were enrolled in a Specialized Academic Instruction (SAI) math class.

The study focused on trying to answer the following questions:

1. Does blogging have an effect on student engagement?
2. What effects do blogging and access to peers outside the classroom have on student motivation?
3. Do students value using blog webs as a tool to aid mathematical communication?

It is arguable that these questions are not only relevant to this study but they also address fundamental issues raised by our traditional approach to teaching students with disabilities.

Methods of Inquiry

The study utilized a mixed research methodology. Included were the scrutiny of homework completion records; administration of pre- and post-project surveys to gain insight into the participant-learners' previous experiences with blogging, and student's attitudes towards mathematics; an analysis of students' blog entries with coding of the response topics; and personal interviews with each of the student-participants. After gathering all of the various data, they were analyzed using a teacher-researcher created rubric and then coded by common themes.

Thesis Objectives

This thesis provides an exploration and summary of the effect of blogging on middle school students in a SAI algebra course. The data also provides insight into how blogging might help foster or hinder homework completion, and the impact on students' attitudes toward math and feelings of self-efficacy.

Significance of the Thesis

The combined results of the literature review, entry level data, pre- and post-project surveys, and blog responses, are expected to be of interest to various academic communities who have an interest in both blogging and mathematics, and students with special needs. The thesis

provides insight that will further the teacher-researcher's personal capabilities and practices; the results have local significance for other faculty in the school as we decide whether to invest time and money into developing web based technologies for instructional purposes. There is also a broader significance: the results of the action research can be disseminated to other teachers in the community and beyond as a way to help them determine the value of introducing the popular communication technology, blogging, into their practice. While the study may not fully inform readers if the use of communication technology in mathematics instruction is effective in motivating and engaging students with special needs, or if such communication technologies should be incorporated into the classroom, the findings will serve to initiate discussion and be a catalyst for further inquiry.

Limitations

The study had several limitations. The small number of participants involved in the study meant that the quantitative data was calculated from small numbers, which tended to skew the reported averages limits and limited the generalizability of the findings. Prior research on blogging in mathematics is not plentiful and what was available had a narrow focus, thus limiting the researcher's ability to make generalizations and draw comparisons to the population of participants.

Action research design brings its own limitations. Teacher-researcher created instruments, as used in this research, lack extensive validity and reliability screening. The use of written surveys was a limiting factor. There was no way to ensure participants fully understood the questions being asked of them or that they were completely truthful in their responses. Utilizing personal interviews and the interpretation of data can be unsatisfactory due to the insider knowledge, assumptions, and bias that are brought to a self-study.

Assumptions

This thesis assumes that readers have a basic understanding of data communications, blogs, and how the Internet works. It is assumed that readers understand how people use a computer to interact with others through a communications network, in this instance blogging. There is an assumption that readers will have a basic understanding of teaching practices, learning theory, and of students with special needs.

Definition of Terms

Blogging: Online Diary on a website, a frequently updated personal journal.

Communications network: Computer networks connect all types of computers and computer related devices; terminals, printers, modems, door entry sensors, temperature monitors, etc.

Internet: A global information service accessed via computer. The Internet is a network of networks which allows information sharing internationally. Examples of ways people communicate on the Internet include: electronic mail, World Wide Web, Usenet Newsgroups, gopher servers, and Internet relay chat.

Motivation: A driving force that initiates and directs behavior.

On-line: The act of being connected to an information service via a computer.

Self-Efficacy: The belief that one is capable of performing in a certain manner to attain certain goals.

Special Needs: Difficulties, in learning created by physical and/or mental challenges.

World Wide Web: A hypertext based system for finding and accessing resources on the Internet network (Newton 1994, p. 1162).

CHAPTER II

Literature Review

In this action research project, the teacher-researcher capitalized on some of the technological tools that students already use outside the classroom. It is driven by the belief in the importance of giving students access to technology tools to help them become successful learners, independent thinkers, and good communicators, while building their confidence and voice using academic language in order to prepare them for 21st century expectations. This study is informed by literature in the areas of computer technology, web logs or blogging, trends in mathematics instruction, student centered learning, motivation, self-efficacy, and the acquisition of academic language.

Mathematics Instruction for the 21st Century

Today's students need different skills to be able to learn how to work and adapt in the world that is continuously changing, as Riedl notes (1996):

> We send children to school to give them the opportunity to move beyond constraints of family and friends to open them to a vast range of possible futures. However the classroom in today's society, by its very nature, is constraining. It isolates both students and teachers from many experiences that will help them to understand the past, develop skills for building a future, and to prepare their role as a citizen. If it once took the whole village to raise a child, then can we expect a succession of isolated teachers to give students all the skills they need to [be] productive members of society?

The need for moving forward both the curriculum of mathematics and the way it is taught as technology advances into the 21st century is forcefully argued by Higginson (1999). Stonewater (2005) discusses that the typical way teaching is conducted needs changing from being driven by lectures to a student-centered learning approach which is engaging and also teaches students how to both learn and to create mathematics. When students are actively involved in the classroom, as in discussions or projects, they tend to be more engaged in their own learning.

Most students are aware of the inherent value of mathematics, but because mathematics requires hard work, they choose to deny its importance (Deitte and Howe, 2003). The research by Hamm et al (2008) proposes that students believe that the math class is not a comfortable place, and as a consequence students do not feel overly confident in mathematics. Cornell's (1999) work reminds us that students often feel that teachers treat mathematics as if everyone should understand it and show little sympathy for those who struggle to comprehend. For many learners, the language of the discipline can be challenging and in combination with the fact that the problems are not usually conceptual, mathematics can seem particularly difficult (Burns, 2006). Burns adds that math vocabulary is difficult to learn, it often takes on new definitions other than how words are used in everyday conversation. Therefore, the academic language of mathematics needs to be taught in a variety of structured, purposeful ways.

The inherent problems that seem to beset mathematic learning are especially pertinent for students with learning disabilities. Schwartz (2006) proposes that trying to convince students that they can succeed is the hardest aspect of teaching lower levels of math. Moniuszko (1992) describes her experiences teaching mathematics to special education students and remedial math classes: "My students are reluctant even to try to achieve in a subject area in which they have already failed, and most see no purpose for, or practical application of, mathematics in their lives" (p.65). Yonezawa (2009) hypothesizes that improving the setting and making it engaging for youths can help improve academic achievement. The principle that learning should engage and reflect purpose and practicality is also addressed by futurist David Thornberg (2000). Like Higginson (1999) and Stonewater (2005), Thornberg, argues for educators to move from teaching to the past to reaching for the future. He postulates that future needs will concentrate

around teaching children three critical skills: 1) how to locate information; 2) the ability to identify what is important; and 3) being able to determine whether the information is accurate.

The National Council of Teachers of Mathematics (NCTM, 2007), states that technology has changed mathematics and that, "Contrary to the fears of many, the availability of calculators and computers has expanded student's capabilities of performing calculations" (1989, p.8).

Cries for change in curriculum and instruction are not new. Previously, the work of Dewey and Vygotsky was an inspiration for change in education. A century ago, John Dewey's analysis of schooling suggested that education should begin with and maintain close ties to the actual classroom experience and concerns of students. However, change seems to be slow, almost non-existent in many classrooms. Dewey[1] noted that "the teacher's suggestion is not a mold for cast iron results but is a starting point to be developed into a plan through contributions from the experience of all engaged in the learning processes" (p.7).

Social Interaction

Hamm (2005), describes how middle school students have a difficult time finding a strong sense of membership and belonging in their mathematics courses. The importance of social interaction in the learning process is emphasized in the work of Vygotsky (1978). His proposition was, "learning awakens a variety of internal processes that operate only when the child is interacting with others in his environment and in cooperation with his peers" (as cited in Peterson, 1992, p.3). Unlike Piaget, whose understanding was that development necessarily precedes learning, Vygotosky (1978) placed more emphasis on social interaction believing social learning precedes development.

[1] Cited in Rogoff et al., 2001

Cornell's (1999) list of common student frustrations in mathematics courses includes students feeling unmotivated due to teachers' implementation of too much individual skills practice, when there should be more opportunities for students to work in cooperative groups. Working in groups tends to enhance individual motivation and provide opportunities for alternative learning or teaching styles, such as peer tutoring. In keeping with Vygotsky's thesis (1978), teachers need to engage students through meaningful learning tasks that involve verbal exchange and social interactions, which can be achieved through writing tasks as well as through discourse. Social interaction is tantamount to collaborative learning and teaching, and likewise facilitates the acquisition and retention of knowledge. In line with Vygotsky's (1978) work on the developmental levels of learning ability, the collaboration with peers, in combination with guidance from the teacher, takes learning beyond the learner's current level and capacity for independent problem solving, and helps students attain their potential development. Engaging in peer questioning, reflecting on and responding to peer's questions, moves a student into their zones of proximal development.

Moore's (2005) research offers insight into what a social interaction lesson may look like. It is one in which the teacher creates a series of problems, questions, discrepant situations or experiences designed to motivate and engage students in the activities and enable them to learn effectively. Moore recommends using small groups to accomplish shared goals, and to maximize students' own and each other's productivity and achievement. If student-student interdependence is structured carefully and appropriately, students value the subject area being taught more, have higher achievement motivation, are more intrinsically motivated, use higher level reasoning strategies more frequently, and achieve better scores in the subjects. This then creates higher self-esteem, develops interpersonal relationships and increases social skills (Moore, 2005).

Student Centered Learning

A student centered approach to learning and teaching focuses on students as active, involved learners versus focusing on teachers and teaching styles. It is regarded as a pedagogy that seeks to increase student capacities by placing the context of real life problems and student interests as central. Jonassen (2000) reflects on how a teacher's work is impacted by such perspectives:

> The purpose of schools should be to educate, to 'educe,' which means to evoke, extract, or elicit something that is latent, that is, to draw out what learners know. That means that you can not tell students what they should know; instead, the teacher's role should be to help them articulate what they know and come to know it better. (p.277)

Ward (2009) adds teaching in a student centered classroom should include the use of various technological innovations that enhance the learning experience by expanding the boundaries of the classroom. As an advocate for student centered-learning, Saye (1998) believes that the technology could create more empowering classroom environments. Similarly, Riedl, (1995) believes that when technology is properly used it allows teachers to return ownership of learning to students. Providing students with the opportunity to use technological tools within the classroom setting, or in conjunction with homework, could help increase student motivation by appealing to a range of learning preferences. Yet, despite the enticement of motivated students actively engaged in meaningful global learning, Borko and Putman (1996) find teachers are fearful to use inquiry based instruction due to their lack of knowledge and experience with alternative teaching methods. One might add technology use to this fear.

Motivation

Understanding what it takes to motivate students to value mathematics can be assisted by defining the word 'motivate'[2]: providing an incentive; moving to action; to impel. An incentive[3]

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[2] and [3]: These definitions are taken from *The American Heritage College Dictionary, 1997*

is something, such as a reward or punishment, which induces action or motivates effort. The motivational incentive is the key to moving a student to action, and the incentive itself could be many things. For instance, it could be a reward, positive acknowledgements, etc., or even a consequence such as detention.

Motivation can be viewed therefore as both extrinsic and intrinsic; learners are partially motivated by rewards provided by the knowledge community, and knowledge is actively constructed by the learner, so it follows that learning is dependant on the learner's internal drive to understand and promote the learning process (Vygotsky, 1978). With this in mind, using collaborative learning would help increase both extrinsic and intrinsic motivation.

A Kaiser Family Foundation study of media use found that 8-18 years olds are spending 6.5 hours a day using technology outside the classroom. Studies indicate that blogging is very popular. Of the 12 million Americans who blog, 57% of bloggers are under the age of 30 (Lenhart and Fox, 2006). Incorporating a classroom website with blogging, the type of technology youths are using, could help to motivate students by encouraging them to make connections between the day's lessons and their homework (Hirsch, 2005). However, as Yonezawa et al, (2009) points out, students are the only ones that can truly offer insight to what is motivating to them.

Self-Efficacy

Bandura, 1997, states that self-efficacy is about self-confidence when performing tasks. Self-efficacy is the result of one's personal capabilities to manage and influence courses of action to attain goals (Edwards, 2009). School is where students "learn" that they lack certain abilities, (and) the interaction between their identity and school can shape who they are (Levin, 2000). According to Middleton and Spanish (1999), American children tend to enjoy, and feel

successful in mathematics in the primary grades, but this falls dramatically with students becoming more frustrated as they progress into and through high school. Cornell (1999) identifies four dominant frustrations that students feel about math: that teachers assume they already possess knowledge of the subject matter; that teachers give them incomplete instruction and fail to provide information thoroughly; that they are unable to keep up with the rest of the class; that teachers overemphasize rote memory and assume students will remember information for yearly assessments. All in all, lack of teacher support and explanation combined with tedious instruction and practice strategies diminish students' willingness to learn mathematics and lead toward an overall feeling of resentment to learn math skills. The result is that motivation to learn and value of mathematics declines greatly.

Marshall et al (2008) conducted a study of 1,222 grade K-12 math and science teachers, to measure their beliefs about self efficacy. The study showed that self-efficacy was reported when teachers perceived their students were engaged in learning, and when they believed that the highest percentage of lesson time was given to instruction (rather than managing behavior etc). The teachers with feelings of high self-efficacy were more willing to make adjustments to their teaching styles and engage in inquiry instruction. Marshall also found that elementary teachers used inquiry learning far more than middle school or high school teachers and did not usually continue because teachers considered they were short of instructional time and there was too much content to be covered. Technology was deemed as being a means to extend instructional time, and facilitate the connection of learning inside the classroom to home.

In order to increase students' expectations of success, Yonezawa (2009) suggests that teachers need to increase behavioral engagement. Youths are texting, blogging, instant messaging and e-mailing inside and outside of school (Yonezawa, ibid). Teachers are competing

with video games and computer technologies, along with i-pods and cell phones. Hirsch (2005) says if students use technology to investigate and collaborate, then when they leave school they will have the opportunity to use their learning which will then be seen as relevant and motivating.

Academic Language and Mathematical Communication

Language plays a critical role in cognitive development; it is how teachers communicate with students, how students express understanding, and it is a powerful tool of intellectual adaptation. Vygotsky (1978) believes that language is thoughts externalized, and is an accelerator to thinking and understanding.

As Burns (2006) states, mathematical academic vocabulary can seem strange, and familiar words take on new meanings. Blogging allows students to gain individual voices that they often hide in the classroom Hamm (2005), acknowledged that math vocabulary can be challenging; the National Reading Panel (2000) concluded that there is no best method for teaching it. Explicit instruction is crucial for learning math terms. Students should see math words written on a chart, that teachers should use symbols when repeating math terms, and have students pronounce the terms. Burns states that writing new vocabulary is beneficial for students and it is important for teachers to encourage students to regularly use math vocabulary in discussions and written assignments. It is therefore important for teachers to use a variety of methods to teach math language and allow students to practice it and make it their own (Burns, op cit).

One associated problem in education today is that teachers are not acknowledging the voices of students in positive adult to youth and peer to peer relationships, fostering students' beliefs that their teachers don't know them and that no one cares for them (Yonezawa 2009). The problem of disconnect will continue to exist while there is separation between the student voice

and the teacher. Web based learning tools can open the lines for communication and can help to bridge the feelings of disconnect.

Rogoff, (1994) postulates that technology can move learning from the traditional classroom to a broader connected environment, sometimes referred to as a community of learners (p. 209). This community approach is reached when teachers and students work together as resources for one another. Students collaborate and participate while teachers support and provide leadership, with both parties openly communicating. Johnson and Shwab (1999) describe classrooms with this environment as a social context in which everyone can benefit, if each member of the group feels a personal responsibility for accomplishing shared goals (p.335).

Allowing students to communicate with each other through technological tools, such as web logs and wikkis helps students gain access to 21st century skills while creating tools for collaboration. These tools are assisting in developing independent thinkers who will have the communication skills necessary to compete in the job market (Hirsch, 2005). Blogging may improve the quality of writing, as Oatman (2005) suggests more ownership of work is established because the writer knows others will be reading their responses. Blogging is a tool that gives voice to students, it lets voices be heard, and develops academic language in authentic ways, as well as permitting the sharing of experiences which allows teachers and peers to find out what is engaging to each of them.

Technology

With dramatic technology changes, it has become important to learn how to incorporate it into the educational process. Integrated technology in the classroom will have an impact on teaching. Knapp and Glenn (1996) stated, “the presence of new technologies will not change schools but if technology is integrated into effective teaching and learning practices it can help

restructure the classroom" (p13). Thornburg (cited in Galas 1997-1998) suggests this will also restructure the future: "We as teachers can truly provide students the real tools of technology to cross the bridge to their future instead of for our past" (p. 21).

In order to prepare students for their future it is important to recognize that the 21st century classroom will be everywhere the learner is. A decade has passed since Thornburg (2000) stated that traditional tools (e.g., books, pens, and paper,) will be replaced with the high tech tools of the 'telematic' era. The teacher's role will change from a productive role to that of a co-learner. Technology will give students the chance to explore, experiment, construct, converse, and reflect on what they are learning so they can learn from their experiences (Jonassen and Wilson, 1999). The future has arrived, but change has been slow in coming to the classroom.

Ellison and Wu (2008) suggest that many educators are interested and excited about internet technologies. Since the development of the internet, different computer technology tools have emerged and continue to be embedded in education. Technology can now be used to help develop communication and cooperation among students and teachers (Ellison et al, 2008). It can restructure classrooms and move teacher-centered lectures to more learner-centered inquiry approaches (Knapp and Glenn, 1996).

Blogging and wikkis are tools that were launched in the mid 1990's (Hirsch, 2005). Both provide supportive environments that give students a chance to communicate with peers and create an opportunity for dialogue with teachers. According to *Support blogging.com* (2010), blogging is about reading and writing, literacy is about reading and writing, and blogging is about literacy, therefore it is a form of communication. Blogging can help stimulate student engagement because they are designed to increase communication. A study completed by Perseus Development Corporation reports that 51.5% of all blogs are created by 13-19 years

olds. Jonassen (2000), states that students do not learn from computers or teachers but rather "students learn from thinking in meaningful ways" (p. 4). Writing web logs: or blogging, encourages students to critically think and examine their own and others' ideas and thoughts: it provides students a place to write; encourages students to take positions; and helps increase critical and analytical thinking (Ellison and Wu, 2008).

Thornburg (2000) states schooling is an activity that every citizen experiences and that through technology the real world is available to all. It allows for less advanced students to feel success, unpopular students gain approval from peers, and (it) motivates the unmotivated students. The use of technology allows student's who are struggling to find a place to search for help, and the tools they need to be successful. Technology can be used alone or in collaboration with their classmates on assignments. It has the potential to accelerate learning and allow students to become independent learners (Hirsch, 2007). Using technology can help simulate what is going on in the classroom and enhance participation and motivation.

Conclusion

The literature indicates that technology is a highly effective way of teaching while increasing self-efficacy, creating independent learners, and motivating students while maintaining a safe and open classroom where students' voices are heard and student centered learning is priority. Studies do suggest that access to computers can improve student achievement (Tienken, C.H. and Wilson, M. J. 2007; Bahr and Reith, 1989; Bangert-Downs, 1985; Capper and Copple, 1985). Computer Assisted Instruction (CAI) has helped improve academic achievement by helping to create active-learners. However, the use of technology in the classroom can be difficult and challenging due to a lack of funding and equipment, despite these drawbacks blogging in the classroom has generated a great deal of support. Blogging may be a positive

approach to teaching and reaching students who otherwise remain unmotivated by the traditional form of mathematics instruction.

Chapter III

Methodology

The choice of methodology for this study was based on an assessment of the optimal strategy for responding to the research questions. The study was an investigation of how the use of a communication-enhancing technology would affect math scores, communication, collaboration, and attitudes toward math, while increasing the motivation to do well for a specific group of special needs students. Specifically, the following questions guided the study.

1. Does blogging have an effect on student engagement?
2. What effects do blogging and access to peers outside the classroom have on student motivation?
3. Do students value using blog webs as a tool to aid mathematical communication?

Overview of the Theoretical Basis of the Methodology

This study was guided by Action Research methodology. Kurt Lewin, generally considered the 'father' of Action Research, first coined the term 'action research' in his 1946 paper "Action Research and Minority Problems", and characterized Action Research as "a comparative research on the conditions and effects of various forms of social action and research leading to social action" using the process of "a spiral of steps." Each step is composed of a cycle of planning, action, and fact-finding about the result of the action. An action research project seeks to create knowledge, to propose and implement change, and improve practice and performance (Stringer, 1996). By the mid-1970s, the field had evolved, revealing four main 'streams' that had emerged: traditional, contextual (action learning), radical, and educational action research. "Educational Action Research" has its foundations in the writings of the American educational philosopher John Dewey who believed that professional educators should become involved in community

problem-solving. Its practitioners, not surprisingly, operate mainly out of educational institutions, and focus on development of curriculum, professional development, and applying learning in a social context. Mills (2003) provides a definition of action research:

> Action research is any systematic inquiry conducted by teacher researchers to gather information about the ways that their particular school operates, how they teach, and how well their students learn. The information is gathered with the goals of gaining insight, developing reflective practice, effecting positive changes in the school environment and on educational practices in general, and improving student outcomes. (p. 4)

Action Research has come to be regarded as small scale, contextualized, localized, and aimed at discovering, developing, or monitoring changes to practice (Wallace, 2000). Action Research was considered the most appropriate form of research for this small scale, localized, educational study because the intent was to help the teacher-researcher improve her classroom practices for professional learning purposes. The researcher set out to find a solution to issues that had been identified within her classroom which included an underlying issue of homework completion, thus the investigation correlated with the purpose assigned to action research.

Setting

The study took place at BMS, a large multi-ethnic school in Ventura County which serves students in grades six through eight following a traditional school year calendar. At the beginning of the 2008-09 school year 1,323 students were enrolled. Within this population, 9% of students qualified for special education services, 8% qualified for English Language Learner support, and 32% qualified for free or reduced price lunches. In 2009 BMS achieved an Academic Performance Index (API) score of 836 (see Appendix A).

The school schedule, Monday through Thursday, is from 8:55 a.m. to 3:00 p.m., and Friday from 8:55 a.m. to 1:30 p.m. Every Friday is “banking day,” whereby all the other days of the week are lengthened so that instructional time on Friday can be shortened. This provides time

for teachers to collaborate and plan with colleagues. The school day is comprised of six (6) periods, first period is 55 minutes long to accommodate Silent Sustained Reading for a ten minute period, while periods two through six are 45 minutes.

The classroom environment is a single, contained classroom organized in a conventional one-desk per student arrangement.

Participants

Teacher-researcher. The teacher-researcher was a Special Education teacher with 5 years of teaching experience at the Middle School level. She was responsible for teaching SAI mathematics in grades six through eight and for case management of the students' IEPs.

Student-participants. The student participants were drawn from the teacher-researcher's eighth grade math class. A letter of invitation to participate in the study was sent to the parents and guardians of all of the eighth graders from a SAI Algebra Readiness class at BMS (see Appendix B). In this way, self selection in or out of the project was contingent upon parental permission. If a parent or guardian chose not to have his/her child be an active participant in the on-line blogging project, the child would use a paper journal to record his/her ideas and responses.

All nine eighth-grade students aged between 12-15 years received parental permission to participate in the study. There were three male and six female participants, each with an Individualized Education Plan (IEP), enrolled in Algebra Readiness, an SAI math class. Seven of the nine participants were diagnosed with Specific Learning disabilities; one student was designated as Other Health Impaired[4] and one student was diagnosed with Autism. One

[4] Understood to include limited strength, vitality or alertness (including a heightened alertness to environmental stimuli), that results in limited alertness with respect to the educational environment, often due to chronic or acute health problems such as asthma, attention deficit disorder or attention deficit.

participant was an English Language learner and another student was a re-designated English Language learner. The following chart summarizes pertinent information about the participants.

Because the teacher-researcher was the teacher of record for the participants she already had access to the participants' academic results, including course grades, California standardized test scores, classroom learning, engagement, homework completion records, and had formed opions about students' levels of motivation in the classroom.

Name	TG	NJ	RL	JM	LM	JN	TO	TS	MW
Gender	Male	Female	Female	Male	Male	female	Female	Male	Female
Age	13	14	14	13	13	13	15	14	14
Grade Level	8	8	8	8	8	8	8	8	8
Ethnicity	Caucasian	Caucasian	Caucasian	Hispanic	Hispanic	Hispanic	Caucasian	Caucasian	Caucasian
Home Language	English	English	English	Spanish	English	Spanish	English	English	English
Prim. Language	English	English	English	Spanish	English	Spanish	English	English	English
Eng. Prof. (CELDT)	N/A	N/A	N/A	Redesignated English Language Learner	N/A	Early Advanced	N/A	N/A	N/A
Regular HW completion	NO	YES	YES	YES	YES	NO	NO	YES	NO

Table 1: Demographics of Student-Participants

Research Design

The design can fittingly be described as mixed methods: action research melded with correlation (Mertler and Charles, 2005); qualitative melded with quantitative data collection and analysis methodologies. The researcher aimed at allowing student participants' own voices to describe changes in their feelings of self-efficacy and motivation in regard to mathematics learning. Therefore, qualitative data was collected via a variety of methods: questionnaire completion, individual interviews, participation in blogging, as well as document review. The personal interviews were "organized around a predetermined set of questions but allow(ed) the questioner to provide encouragement, ask probing questions, and request additional information" (Mertler and Charles, p. 39). The following matrix shows the sources for the data that was collected in an attempt to answer each of the three research questions posed in this study.

Research Questions	Data Source #1	Data Source #2	Data Source #3
1. Does blogging have an effect on student engagement?	Student's Responses to Surveys	Summative interviews with students	Grade book records
2. What effects do blogging and access to peers outside the classroom have on student motivation?	Post-project Survey	Summative interviews with students	Grade book records
3. Do students value using blog webs as a tool to aid mathematical communication?	Blogging responses	Post-project Survey	Summative interviews with students

Table 2: Matrix Showing Sources of Data for Each Research Question

Emergent themes were extrapolated from participants' responses to the teacher designed and composed pre-project survey (see Appendix D). In order to determine how prevalent the expressed opinions and important themes were, quantitative data was calculated.

Data Collection Methods

This research incorporated sequential mixed methods[5] to gather multiple sources of evidence to provide both descriptive and evaluative data. This 'blurring of boundaries' (Yin, 1989), is used to more effective "explore, describe and seek to explain a contemporary issue… within its real life context" (Ortrun Zuber-Skerritt and Perry, 2002)." The variety of data gathering instruments used and the functions they served are summarized in the following matrix.

[5] A research design in which one type of data provides the basis of the collection for another type of data. Quantitative and qualitative methods are mixed throughout the design of the study.

Data Collection Instruments	Function of the instrument	Full Text in Appendix
Pre study Questionnaire	To reveal students' prior knowledge of blogging	C
Pre-project Survey	To gain insight into students' attitudes and feelings towards math and provide a baseline for the post-project survey	D
Blog Questions and Posts	To provide a platform for students to communicate with each other and the teacher, to disclose understanding of mathematics content, and express attitude and feelings towards math	F and G
Post-project Survey	To allow researcher to determine changes in attitude and feelings towards math	H
Summative Interview	To facilitate reflection, and provide student opportunity to explain their responses and describe their attitudes	I

Table 3: Data Collection Instruments and Functions

The qualitative data gathered from these various instruments were subject to content analysis: responses were collated, coded based on themes that emerged from the analysis, and frequencies calculated for topics that emerged from the responses. Similarly, the on-line blog responses participants made to questions posed by the teacher were examined to find common themes. As the blogs were assigned homework tasks, and the teacher-researcher was trying to determine if using technology improved completion rates, a rubric was developed to score the blog entries on several criteria (see copy of the rubric in Appendix J). The scores were tallied and subjected to descriptive statistical analysis to reveal frequencies and enable the teacher to find if there were changes in homework completion, and compare the results with that of more tradition forms of math homework.

Length of Study

The Action Research project began on November 1, 2009, the beginning of the school's second academic quarter, and continued until the end of the third quarter, April 1, 2010. Students

were asked to blog twice a week for a total of 19 weeks. Blogging was a part of extra-mural activities (homework). It was estimated that it would take students approximately 10-15 minutes to answer each question. If students were unable to blog nightly, students could catch up on their own time with no penalties to their grade until specific grade checks were due to be reported.

Ethical Considerations

Winter (1996) offers guidance to researchers: "Ethics is not something that you can forget once you satisfy the demands of human subjects review boards and other gatekeepers of research conduct…Rather, ethical considerations are inseparable from your everyday interactions with others and with your data." (Glesne and Peshkin, 1992, p. 109) The research proceeded in a manner consistent with such advice.

Initially, a conversation took place between the Principal and the teacher-researcher, which resulted in gaining permission to use the teacher-researcher's classroom to complete the study (see Appendix K). The intent and procedures of the study were then explained to students and their parents at Back-to-School Night, and subsequently a parent letter was sent home. The letter explained that participation in the study was voluntary, anonymous, and in no way affected the students' grades in the course. Students, desiring to take part in the study, returned a signed letter from their legal guardian showing consent and authorization. In addition, the study was filed with the university's Institutional Review Board. A letter of approval was returned by the IRB committee granting permission to continue with the study (see Appendix L). During the interview process, at the conclusion of the study, homework scores, course grades, and benchmark assessments were available to each student for information purposes and to provide a context for the interview discussion, as well as maintaining transparency of the data collection processes.

The blog site used for this study was supported by the platform *21Classes*.com, which was approved by and made available through the school district technology department. The *21 Classes* site is strictly controlled and monitored through the school district and open access is not available unless the teacher-researcher grants permission.

To further protect the identity of the participants, should the site be compromised, and better provide anonymity during the study students used only their first and last initial and the number 81. This still enabled fellow students to recognize who was posting a response. Given this was a communication technology project, it would have been impossible, and unwanted, to hide the identity of students from each other. A master list of students' names and initials along with all written data collected was kept in a locked filing cabinet in the teacher's classroom. The actual name of the school was not used for the study's purpose. The aim was to improve children's psychological well-being as it relates to concept of self as mathematician.

Data Collection Instruments

A pre-project questionnaire was administered before devising the blogging protocols, this disclosed student's prior knowledge of blogging and was a basis for the project design (see Appendix C). When asked what kind of topics they wanted to discuss on the blogs, responses were wide ranging: math topics, hobbies, music, daily life, movies, travel, "easy" topics, food, and family. Results showed that no student had experience with blogging prior to the study beginning (see Appendix E). Only two learners had any knowledge of blogs. One respondent stated that he knew blogs were "in fashion on the Internet." The other responded that blogs were "a new kind of homepage." This information led to the design of the study.

A pre-project survey was completed immediately before the onset of the project, which required students to check whether they agreed or disagreed with a given statement to determine

if students perceived themselves as effective and/or successful math learners and uncover their attitudes towards mathematics (see Appendix D). This was administered presented by both the teacher-researcher and an outside source, a 7th grade English teacher. In the following chart, the statements are shown, but have been organized to show which of three concepts from the research questions they reference: self-efficacy, attitude or performance.

Self-Efficacy	**Attitude**	**Performance**
Math makes me feel un easy and confused.	I like math, but I like other subjects just as well.	I would like to develop my math skills.
I don't feel sure of myself in math	I detest math and avoid using it at all time	I don't think math is fun, but I always want to do well in it
I have never liked math and dread it.	Math is very interesting, and I have usually enjoyed my classes in this subject.	
Math makes me feel uncomfortable.	Math is less important to peoples than art or literature.	
I have always enjoyed studying math in school.	I like math because it is practical.	
I have always been afraid of math.	An understanding of math is needed by artists and writers as well as scientist.	
I avoid math because I am not very good with figures.	Mathematics is not important in everyday lives.	
I enjoy doing problems when I know how to work them out.	I have never liked mathematics.	
I am afraid of doing word problems.	Math is very worthwhile and necessary subject.	
Math helps develop a person's mind and teachers him or her to think.	There is nothing creative about mathematics; it's just memorizing formulas and things.	

Table 4: Categorization of Pre-project Survey Items

A pre-blog assignment was presented to the whole group at the beginning of the project to teach students how to blog (see Appendix F). A simulation exercise was created by the teacher-

researcher in which she created blog questions and students used post-it notes to simulate anonymous blog postings to answer the questions, this taught web etiquette and demonstrated courtesy to others before moving on-line to blog. Students were then given an on-line lesson on blogs and instructed on how to respond to a blog prompt on *21classes.com* and on procedures to create a safe self-learning environment while maintaining a minimum risk to other students.

Blogs were assigned for homework twice a week with traditional homework assignments on alternate evenings. They provided a platform for students to communicate with each other and the teacher. As all students had home access to computers, the expectation was that blog postings would be completed out of school as with other homework assignments. If students were unable to access a computer for whatever reason, they were told the assignments could be completed on a school computer during recess, lunch or after school. Students responded to prompts written by the teacher (see Appendix G). These were intended to disclose students' understanding of the mathematics content being taught, but also to encourage students to express attitudes and feelings towards math (self-efficacy and perceptions of performance), and to find out if students were more likely to complete homework using a novel technology as opposed to the typical paper and pencil tasks. In one blog, for example, students were asked to share personal experiences when they felt uncomfortable with math or had questions about the day's lesson, and encouraged to share their comments and or questions with their classmates and teacher. The responses students posted were collected and coded according to themes that emerged from an analysis of the responses.

The teacher-researcher created a criteria-based rubric to evaluate students' blog postings (see Appendix J). The five criteria described the overall use of blogs, intellectual engagement with the key concepts, personal response to key concepts, writing quality (including use of

appropriate academic language), and timeliness. In keeping with Mercer and Charles' (2005) description, the rubric ratings then served as a data source which was analyzed by comparing students' responses. In order to reduce teacher bias from previous interactions with the students and their work, a teacher not involved with the study and who was unfamiliar with the students randomly affixed numbered labels to printed versions of the blog postings. Students were assigned numbers between 1-9. The list of names and corresponding numbers was not viewed by the researcher until after blogging responses were read and rated. The teacher-researcher scored all blogs separately before comparing independent results and determining underlying themes.

A post-project survey was administered at the end of the third quarter, the conclusion of the project. It was composed of the same content as the pre-project survey and administered by the same outside source. Four additional items were added to the pre survey, requiring students to respond to specify their level of agreement to given statements designed to disclose students' feelings of self-efficacy, attitudes and performance before blogging and after blogging. Students selected a rating from a four point Likert scale. The data gathered from the additional items were used to help cross validate and inform further data that had emerged from the other data collection instruments (see Appendix H).

A summative interview was held between the teachers-researcher and each participant. The 10 minute face to face individual interview was held in the classroom and tape recorded Students responses and remarks were used to cross validate data from the gathered through the surveys and blogs (see Appendix I).

Data Management and Analysis

The wide range of data collection instruments yielded a considerable, and cumbersome, quantity of information. To efficiently and effectively reduce the large quantities of textual data

and find relevant information, a coding mechanism was used. Content analysis allowed the data to be coded for qualitative and/or quantitative analysis.

In keeping with what Creswell (2005) calls a "bottom-up" approach, the qualitative data were analyzed and organized to establish meaningful patterns. Student blogs were read (many times) and highlighted for "categories (topics) and then for relationships among the categories", (Goetz and LeCompte, 1981, p.57). Creating simple data categories was difficult because subcategories emerged. As similarities were found, the responses were grouped accordingly. Each groupings was assigned an initial short meaningful name, or code, according to the teacher-researcher's interpretation. Relationships (or themes) were then sought between the coded categories. Table 5 (p.34) details the themes and codes that emerged from analyzing the raw data to find common categories in the student-participants' responses. This method of coding data only enough to generate categories and hypotheses allowed the teacher-researcher to make generalizations, in a way consistent with the Grounded Theory process described by Glaser and Strauss. (1967).

The same process was followed with the surveys and interview data, and then all categories were collapsed into major recurring themes. The frequency of occurrence of the specific categories and themes were calculated to obtain some quantifiable means. The number of times the same category emerged in the student-participants' responses gave insight into its relative importance in their perspectives (see Appendix M). The rich qualitative data were used to provide explanation and depth to the numerical results.

Additionally, students' academic information, for example, grade point average (GPA) and District Benchmark scores, and demographic profiles, such as students' ethnicities and English language proficiency, were also examined to help establish trends pertinent to the study's findings and to inform the teacher-researcher.

CHAPTER IV

Finding/Results

This chapter reports the findings from an exploration of the effects of blogging, a communication-enhancing technology, on middle school students' engagement, attitudes and motivation in mathematics learning. The teacher-researcher was operating under the premise that the technology would encourage greater social interaction, and higher levels of engagement and would improve the perceptions a small group of special needs students' held about themselves as effective learners, thus increasing their motivation to do well in mathematics. The ultimate intention of introducing blogging into weekly homework assignments was to determine if the novel technology would positively impact homework completion rates, and if academic grades would subsequently increase. With these goals in mind, the findings include the nine student-participants' scores on the California Standards Test (CST), on district benchmark exams, and their overall math grades in a SIA Algebra course. Students' homework completion records and scores are also described to see if they alter when blogging is utilized. Data for the study was gathered through multiple methods, and provided both quantitative and qualitative data each of which informed the other.

Entry Level Data

A pre-project questionnaire was administered to the participants in order to gain insight into their previous experience of blogging because it was determined important to verify students' prior knowledge[6]. The responses revealed that no student had blogged prior to the start of the project, and only two of the nine could offer any explanation of what blogging entailed.

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[6]Prior knowledge can be explained as a combination of the learner's preexisting *attitudes*, *experiences*, and *knowledge*: *The Strategic Teaching and Reading Project Guidebook* (Kujawa & Huske, 1995).

Responses to the questionnaire were used to organize the design of the project: such as, how often students should be required to blog each week; what topics should be addressed in the blog prompts that students responded to; and what would be reasonable expectations to achieve by using blogs in a mathematics class. Additional to the questionnaire, a survey was administered that aimed at disclosing students' attitudes towards math prior to the implementation of the project.

Major Findings

What topics did students blog about? As part of their homework assignments, twice a week for two consecutive school quarters, students responded to questions posed by the teacher-researcher on a classroom web log site. The responses were collated and coded to reveal the themes about which students blogged. The following table presents, the main content addressed in students' responses (in rank order), codes that were used when categorizing the data, and the major themes that emerged from the analysis.

Content of blog response	Coding	Theme
		Learning
Referencing a Problem	Sharing Examples	
Referencing Feelings	Sharing Thoughts	
A personal account of an experience	Sharing Experiences	
		Emotional Sharing
Discussing personal fear	Fear	
Discussing what they liked in the lesson	Like	
Discuss what they disliked in the lesson	Dislike	
		Reflection
Reflection on personal experience	Personal Reflection	
Reflection on learning or what they learned	Reflection on learning	
		Asking questions

Table 5: Content, Codes and Themes Extrapolated from Blog Responses

The students remained focused on blogging about what they learned in the lesson, often restating procedures for solving math problems. There was little mathematical discourse that was

initiated by the students, neither posing questions to each other nor responding to what a student wrote in a blog.

The background information provided by the nine eighth-graders in surveys, their specific responses to the blog prompts and during face to face interviews enabled the teacher-researcher to answer the three initial research questions she posed. Each question is addressed below.

Has blogging increased student engagement? Prior to the study, the participant learners were not always completing their homework. It was important for the teacher-researcher to identify if lack of engagement in the SAI mathematics classroom resulted in lack of understanding of assignments, thereby accounting for homework not being completed. Regardless of whether or not they completed homework, students claimed to be engaged in math class for various reasons. One participant commented, “Students are engaged because of you (the teacher), you make class fun and exciting.” When students are doing something they enjoy, they are engaged, and happy. What specifically made lessons engaging were active learning tasks: “We really enjoy the hands on activities in math.”

In their blogs, in different ways, students expressed enjoyment for math and their understanding of topics. At the end of the two quarters when final grades were submitted, participants were interviewed about their scores and the data that resulted from the surveys and the blog responses. What emerged was that students were engaged in the math lessons and engaged in the blogging project, which was described as “fun and exciting”, “I liked it because it was new.” The students recommended continuing the project with future groups: “Blogging is cool and it is something different, no other kids are doing it in their classes.” “You are always trying new things in here and keep me involved.”

However, enthusiasm for blogging was not universal. One student, who regularly did homework remarked, “It was hard for me.” He had a difficult time with blogging because he didn’t feel “comfortable”, and was not confident using the computer. This did not mean he lacked engagement, but that it was difficult for him to complete the project regularly. Another student found it “challenging” to complete the assignments because of limited access to the computer. “I couldn’t always use my computer because my brothers were always on it.”

What effects did blogging and access to peers outside the classroom have on student motivation? Middle school teachers try to motivate students by using different tools and new techniques in their classes. The students recognized this, as one commented, “the teacher is always trying new things, this helps to motivate us.” The blog responses and face to face interviews with the students revealed what they perceived to be some of the motivating factors within the classroom.

Students were asked to respond to the following blog prompt: “Do you feel motivated to be in this math class? Why or why not? and, What do you find to be motivating, or what could the teacher do to help motivate you?” All the students shared that the math class itself is a motivator, “I like the way the teacher teaches us”, “and the teacher motivates us with rewards and praise.” This implies external rewards are valued, as attested by one student, “My favorite experience in math was when I got an A on a test and got a homework pass.” Students also reported being motivated by the smaller class size which led to: a comfortable atmosphere, teacher availability, and a safe learning environment. The instructional design gave rise to feelings of efficacy, “Math is fun, it makes me feel smart because of the way the teacher explains it.” The idea of students feeling more efficacious as a result of increased motivation was explored.

Did students report feelings of greater self–efficacy as a result of blogging? A blog prompt asked students to comment specifically if they felt that they were successful math students and what led to success. The following graph indicates the prevalent themes that emerged as students identified what contributed to being successful in the math class.

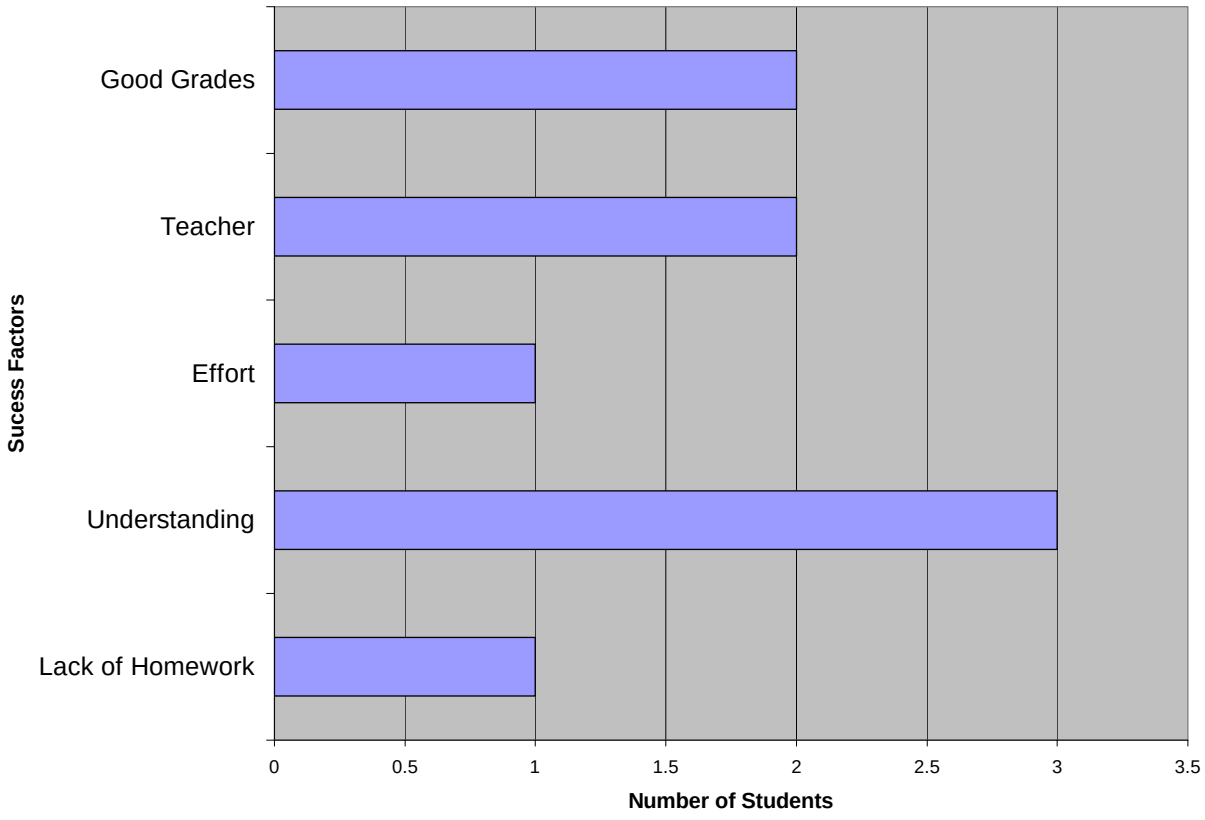

Figure 1: Factors that Students' Considered Contributed to Success in Math

In order to be successful, students believed "understanding the topic" was critical and that "it is important to get good grades." The teacher was seen as an external determining factor of success, while an internal factor was the effort expended. Students were clearly acculturated into the formal expectations of schooling in that, as one student remarked, "Homework completion is important and the teacher helps to create a successful student."

At the conclusion of the study, students were given a post survey and results were analyzed. In order to further the researcher's understanding of students' motivations, perceptions of self-efficacy, and the impact of blogging on math performance, four questions were added to the original pre-project survey. The questions used a four-point Likert scale. Several additional themes emerged from the responses to these additional questions at the end of the post-project survey, which pointed to 88% of the participants believed they were successful math students. One student who did not regard himself as being successful saw this as within his own control, "I don't always do my work and try my best, this makes me not successful."

Was there evidence of a relationship between increased level of engagement and academic performance? Overall, students reported an increase in engagement, the content and delivery of the math program was viewed positively and blogging was something they enjoyed doing. The teacher-researcher turned to the academic performance data to see if there were any significant changes in results that could be linked to the increase in engagement.

The chart below shows academic performance by students. Students' GPAs varied widely from 1.5 to 3.6. Six of the nine students (TS, MW, JN, LM, TG, RL) share similarities in their academic performances: low GPAs ranging between 1.5 to 2.8; in the second quarter their grades were C's and D's; and they attained similar Math grades during the third quarter. It should be noted that the grading scale for the class follows a traditional scale of 90 to 100% for an A grade, 80 to 89% for B, 70 to 79% for C, 60 to 69% for D, and 59% and below is awarded F.

Student	TG	NJ	RL	JM	LM	JN	TO	TS	MW
Overall G.P.A.	2.1	3.6	2.5	3.6	2.8	1.8	3.1	1.5	2.3
Quarter 2 Math Grade	C	B	B -	A -	B -	C -	D -	B	C +
Current Math Grade	D	B-	C-	B	B-	D-	C	B	B-

Table 6: Academic Performance Results for Participating Students

Quarterly benchmark tests are required by the School District. These benchmarks reflect the state content standards being taught each quarter and results are used to guide instruction. The tests are seen as indicators of how students will perform on the “high stakes” California State Testing (CST). The following table shows how each of the students performed on the quarter mathematics benchmarks during the period of the study.

Student	TG	NJ	RL	JM	LM	JN	TO	TS	MW
Quarter 2 Math Bench mark	Basic	Proficient	Basic	Proficient	Basic	Basic	Basic	Basic	Basic
Quarter 3 Math Bench mark	Basic	Basic	Basic	Proficient	Basic	Basic	Below Basic	Below Basic	Below Basic

Table 7: Quarterly Mathematics Benchmark Results

This table shows students’ scores varied between the two quarters. More students struggled with the math concepts taught in the third quarter. Four students showed a drop in their third quarter results, three of whom dropped from the ‘basic’ to ‘below basic’ level. Each of those students had missing traditional, paper and pencil, homework assignments as well as missing blogging assignments. One of the students (TS) had an increase in missing blogs during the quarter. While TO and MW increased assignment completion during third quarter, they had difficulty with the benchmark tests.

Student	TG	NJ	RL	JM	LM	JN	TO	TS	MW
Grade 7 CST Math	Basic	Below Basic	Basic	Basic	Basic	Basic	Below Basic	CMA 43	Basic

Table 8: Participants’ CST Scores

The desired outcome for students on the benchmarks is ‘Proficient’ or above. The test score results for the previous year record all participants scoring below grade level on their math skills. According to the current benchmark data, it is estimated that eight of the nine students will not perform on the CSTs at the desired Proficient level.

As noted in the above table, the CST participant-learners' results for the 2009 academic year demonstrate consistently low scores in the Below Basic to Basic range. It is important to recognize that each student was performing below grade level and had an IEP. Although the students were performing below grade level, they were making growth in their IEP areas. Comparing CST test results with the benchmark test data showed just 22% of the students making growth and improvement from their CST scores. One student's scores dropped, while more than half (55%) of the students' results remained unchanged.

The limitation of standardized testing as a measure of knowledge and/or student engagement is acknowledged. As many educators agree the standardized tests scores are affected by a myriad of factors and often do not accurately reflect the student's true knowledge. Nonetheless, the testing data provided intriguing insights and cause for inquiry into whether there was any correlation between students' results and perceived levels of engagement and the completion of blogging homework assignments. The blog posts revealed that students were engaged and believed themselves to be learning in the classroom, but the quarterly results did not support a correlation between the level of engagement and student academic performance. Although high grades were not attained, students showed progress.

Did homework completion improve due to the introduction of blogging? The researcher had assumed homework completion rates would rise and positively impact the students' math grades. While homework completion in general increased over the two quarters, except for one student, overall homework grades did not. 44% (4/9) of students' grades were lower in the third than in the second quarter, and one third of students' grades remained the same. Blogging was an attractive homework alternative for most students, but two students missed more blog assignments compared to their traditional homework output.

Overall, students' missing traditional homework assignments decreased over time for all students. The graph below illustrates the difference between traditional homework and blogging over the course of the project.

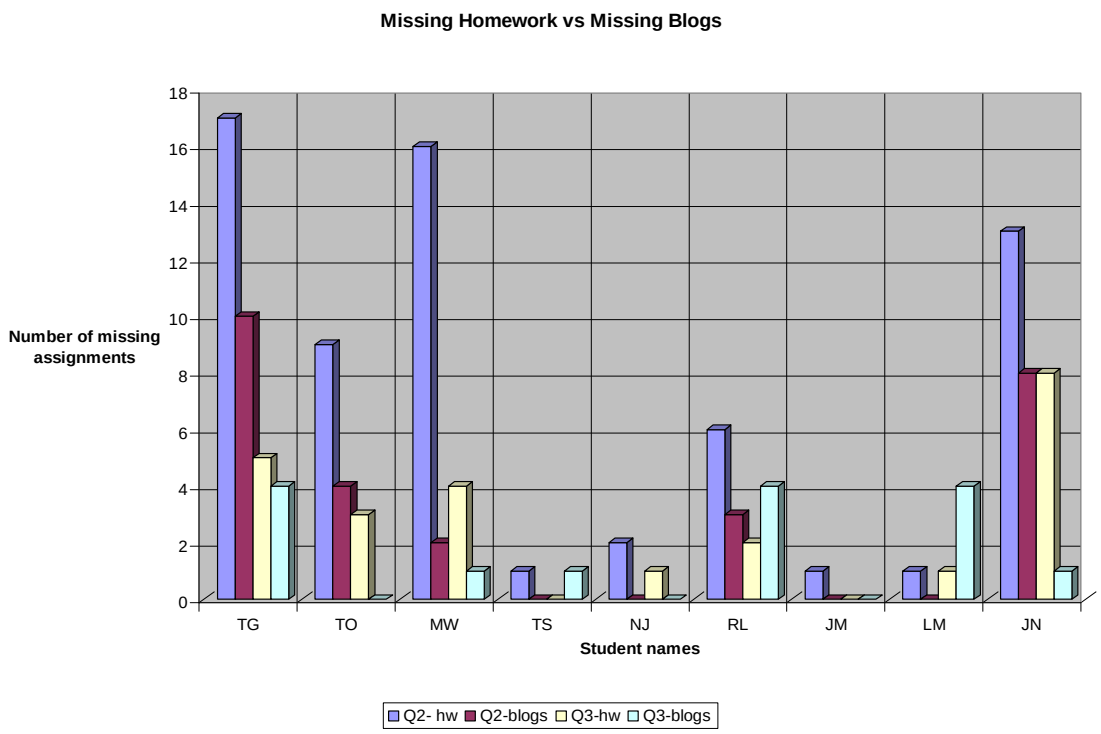

Figure 1: Record of Missing Homework and Blog Assignments

This chart is very revealing. It presents considerable data about the students completing their homework in the SAI math class that might not have been gathered otherwise. Traditional homework assignments were given two evenings a week and blogs were given on alternative evenings. There was the same number of traditional homework assignments as blogging assignments. Missing traditional homework assignments decreased significantly over the quarters for all students, although the reasons why are difficult to determine. There were fewer paper pencil tasks thus giving students a break from their usual routine of daily homework assignments.

The number of participants who missed blogs compared to missing traditional assignments remained relatively constant over the two quarters. For three of the nine students the number of missing blog assignments increased. Students had excuses why blogging homework was missing: some were the usual, “I forgot”, but others were specific to the computer, “I lost computer privileges.” Having access to the internet was the reason most students did not complete their blog assignments. Seven out of nine students found, “limited access to the computer was an issue.” Students suggested “it would have been better as an in-class project” then blogs would have been completed. The main hindrance to full participation was having access to the shared home computer. Seven out of the nine students shared “access to a computer (and that) was the most challenging part of this project.” When asked why school computers were not used, a typical response was “I don’t know, I mean I know I could have, I just always forgot to come in and do it.”

Although students thought blogging was fun and different, for students with a history of missing homework assignments similar difficulties with homework completion remained.

Students stated that they enjoyed the project and felt that it was beneficial to blog because it made them think about what they were learning. They did not believe it made a difference in their scores but did believe that it made them better math students.

Do students find value in blog webs as a tool to aide mathematical communication? A sample of five blog prompts and their entries were selected from each of the nine participants’ and coded in order to reveal what topics students were communicating about. The themes and frequencies are shown below.

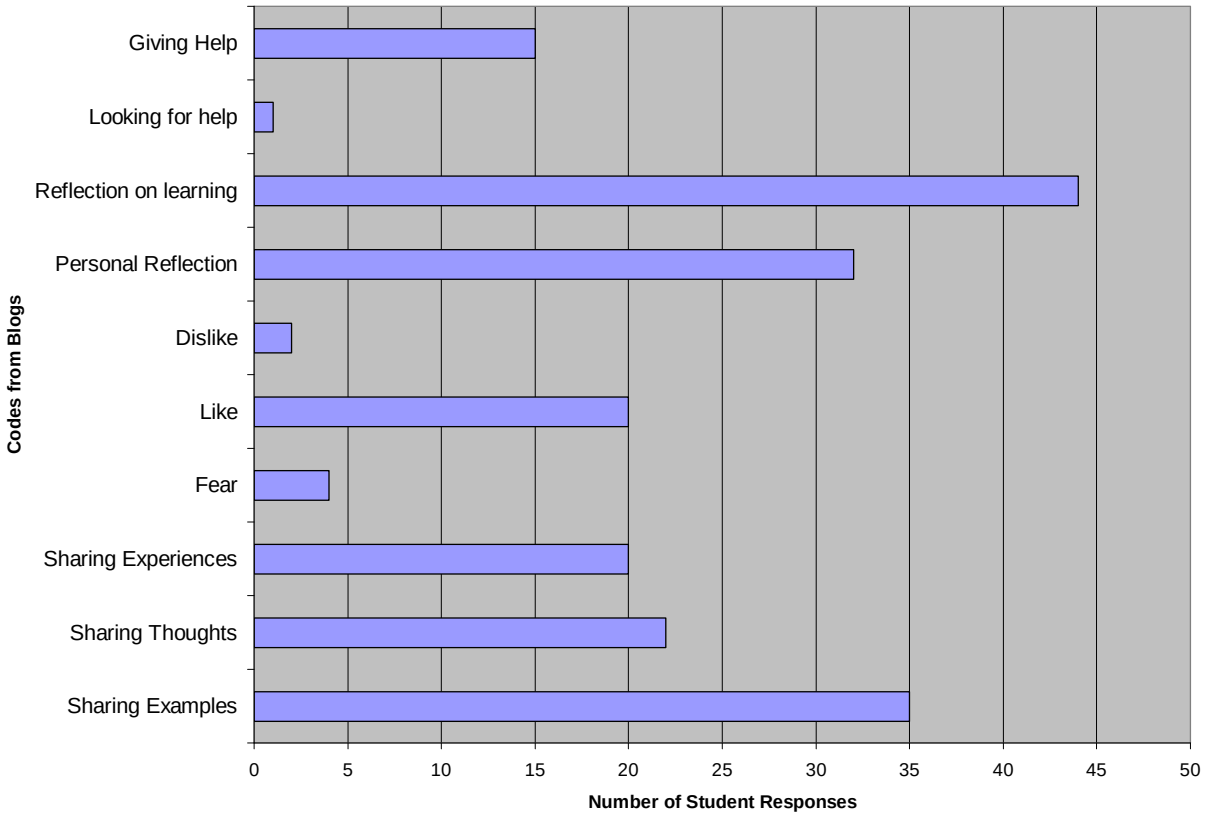

Figure 2: Codes for Blog Responses

The nature and content of the blog responses indicated that students did not utilize the blog in seeking assistance from their peers. One student wrote "I am still having trouble remembering the steps to solve a two step equation", but did not ask other members of the group for help. Just two students used the blogs as a platform from which to complain or chat about their dislike of mathematics: "I do not like math because it has too much homework", "I hate fractions."

What students did blog about to the teacher was what they learned during the math lesson (mentioned 44 times) and referenced examples from the daily lessons' content (35 times). The use of academic vocabulary was marked: "You solve a proportion problem by using cross product," they used analogies to explain their thinking, "then you draw a river and divide both sides by the same number, (because) you want to get x by itself."

Two of the most frequent uses of the web logs involved relating what was personally learned during the lesson (45 times); “to solve a fraction with unlike denominators you have to find the LCD and change the denominators so they match. What you do to the denominator you have to do the numerator. Then you are ready to add or subtract. Don’t forget to simplify the fraction when you are done!” The focus was on memorizing the procedure, a typical instructional technique with special needs students. Describing solution strategies or presenting deeper explanations of why the traditional algorithm worked was never undertake.

Personal reflection was another frequent theme in the blogs (37 references); sometimes students identified challenges saying, “I found the test really difficult”, “I struggled with the two step equations”; other times the challenge was framed more positively, “I really like when we play Survivor Math in class, it makes me work with a team and it’s always different and challenging.” Student opinions mostly centered on their own experiences (20 times) and were very informative for instructional planning: “I had difficulty with math in the sixth grade, but, when I came into your class, I started to get it because of the way you explain things. The way you work at a slower pace, and all the examples you show us really helps me learn.”

Chapter V

Conclusion and Discussion

The purpose of this action research was to determine if the familiar yet novel blog technology might increase student engagement and motivation and alter attitudes toward math. Additionally, I wanted to know if using blogs as a collaborative tool would encourage the participants to link learning from school to home. The participants were the nine eighth-grade students in the researcher's Specialized Academic Instruction (SAI) mathematics class. The study also sought to determine if the students attained higher achievement levels and improved grades as a result of frequent mathematical communication with their peers and teacher. An underlying premise was students feel successful when they contribute to their own learning, "I am successful because I always do my homework and I get good grades" as one student reported.

Blogging was not as successful as I had anticipated based on the research literature I reviewed. Students did not use the blog webs to communicate with each other directly, nor did they use it as a journal. Blogging is technology's equivalent to journal writing, and journaling is considered one way to increase student thinking. Blogging involves inquiry and is student centered[7] and allows students to critically think and examine their own ideas and thoughts. I had expected students would pose questions for others to answer as a catalyst for mathematical discourse, but found that students needed assistance from me, the teacher, in posing questions to answer. Blogging was not a mechanism that automatically encouraged greater academic collaboration but students started talking to their peers whom they knew were blogging. While the blog web did not serve to initiate discussion in the way expected, indirectly it created conversation. Students reported that they did not participate or strike up on-line conversations, but that blogging became the topic of conversation before class: "I started asking (my peers),

[7] http://coe.sdu.edu/eet/articlesblogging/edu

what did you say or how did you answer the prompt last night?" or "We started asking each other about what we wrote about." Furthermore, students who normally had little interaction with each other found a common connection: "They (are not a person) who is my (social network) but we started talking to each other outside of class and I may not have talked to that student previously"

The problem of homework completion remains an unsolved mystery. Students who regularly did homework continued to do it, likewise students who did not turn in homework remained unmotivated by blogging assignments. Over the course of the project, scores for more traditional homework assignments improved for some students. Two students' homework scores improved and each had fewer missing assignments. Scores were looked at holistically, the more assignments completed the higher the final grade, with homework scores accounting for just 15% of the total grade. Only one of the nine students continued not to do homework. "I don't care, it is not important to me," one remarked. Grades rely on more than test scores and class and homework grades. "I could have done better, I just did not try," remarked one student, highlighting that effort is a determining factor. Such a statement, illustrates how the student recognizes that self-efficacy is the result of managing personal actions to attain one's own goals (Edwards, 2009).

Studies suggest that access to computers can improve student achievement (Tienken, C.H. and Wilson, M. J. 2007; Bahr and Reith, 1989; Bangert-Downs, 1985; Capper and Copple, 1985) and that Computer Assisted Instruction (CAI) improves academic achievement by helping to create active-learners. The data collected here suggests that blogging homework was not regarded as more novel or more special than traditional homework assignments. While blogging helped to increase homework completion over time, it did not improve everyone's grades. Indeed completion of the blogging assignments decreased during the third quarter for some students. It

can be proffered that the novelty factor diminished. Students treated blogging assignments in the same way as traditional assignments. Students who consistently did homework continued to do so, and those whose homework completion was inconsistent had similar excuses to why they were unable to do their homework. Students who had missing blogs, or homework claimed: “I had no time”, “I couldn’t access the program,” “I was grounded from the computer”, or “our computers weren’t working.” Having access to computer programs at home is a new phenomenon and creates a new category of reasons for missing homework assignments. Whereas, not taking advantage of the access available in the classroom drew ‘old’ excuses: “I came to school late”, or “I forgot.”

At the onset of the project it was expected that homework scores would improve with the introduction of blogging, but instead the responses and results showed no change for most students’ grades, performance in class, or scores on tests. Students who did not regularly complete their homework realized the connection, “I did not give it my all and I know I can do better and should (have).” When students were asked if they believed not completing homework effected their grades, and if poor homework scores then affected their motivation to do well, most students said, “No”. Overall, blogging assignments did not appear to change students’ attitudes to math nor have any appreciable effect on motivation.

Successful teachers know the importance and value of provoking interest and providing motivating and engaging learning opportunities that students can apply to their everyday lives, yet it did not seem to matter what tool that was provided. Students who viewed themselves as successful learners continued to be more successful learners. Such intrinsic motivation calls into play the impact of inspiration from other sources: home life, personal experiences, and dreams

that students have for themselves. Measuring such variables was beyond the scope of this research project.

Future Research

Most students recommended that blogging should continue in the classroom. “Yes, blogging should continue because it is fun and no other teacher is doing this with their students.” It would be interesting to continue this Action Research project using a three year plan to look at how students change from 6th grade to 8th grade. It would also be interesting to see how writing changes over the course of three years, how math performance changes and/or to see if attitudes change. Middle school students often do not feel a connection with their teachers and this could help students make those connections they are lacking in middle school, especially if they partnered in a longitudinal study over the entire course of the middle school experience.

Many students had trouble with access to home computers and although they knew they could access the student computers in the classroom, they made a decision to not. Looking back and reflecting on this study/inquiry it makes sense to implement this practice as classwork instead of making this a homework assignment, it might be more useful to have students work on this in class and maybe connect up with another class period. “I think it would be cool to blog with another period.”

Due to 45 minute periods, fitting it in to the regular school day would present a challenge. Teachers have time lines given by their district and state which also creates an issue. Students are expected to learn specific standards by the end of each quarter and there is no room to veer off the pacing guide. The emphasis placed on state testing and high scores also create an obstacle for teachers to think outside of the box and bring in innovative ways to teach. It would be beneficial for students to reflect daily on their class session as a form of journal entry, instead of

answering questions presented by the teacher. This would be an excellent tool for both the teacher and student to see how and what the students are learning. Journal writing can be used as a form of assessment of how the students are doing and what knowledge they are grasping. This would also provide insight into teaching practices as it did mine. Because the project was not as successful as I had hoped I would change things around for future research by having students work with partners from other classes, have students start with journal writing and evolve it into blogging, the work would be completed in class, and instead of prompting the students I would have them reflect on the lessons from class.

Summary

By integrating the weblog into the classroom and incorporating electronic writing into the classroom experience, teachers can help their students to enhance their mathematical understanding: “Blogging was cool, it made me start thinking about how to solve the problems, and I looked at other student’s blogs to check if I was right.” Blogging can be a constructive tool in the mathematical learning environment. It helps to promote critical thinking skills, collaboration, and differentiated instruction by using multiple learning styles.

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APPENDICES

Appendix A:

2009 Academic Performance Data for BMS

2009 Academic Performance Data for BMS

2008 Base API	2009 Growth API	Growth in the API from 2008 to 2009
811	836	25

2009 API Score (CDE*)**

Met 2008-09 Growth API Targets:

School wide	Yes
Comparable Improvement	Yes
Both	Yes

		Ranks			Targets	
Number of Students Included in the 2008 API	**2008 Base API**	**2008 Statewide Rank**	**2008 Similar Schools Rank**	**2008-09 Growth Target**	**2009 API Target**	
1322	811	8	4	A	A	

2009 API Growth Targets (California Department of Education, 2008)

The following table shows the school's demographic data:

Subgroups			Subgroup API		
Ethnic/Racial	Number of Students Included in 2008 API	Numerically Significant	2008 Base	2008-09 Growth Target	2009 Target
African American (not of Hispanic origin)	33	No			
American Indian or Alaska Native	16	No			
Asian	50	No			
Filipino	11	No			
Hispanic or Latino	492	Yes	731	5	736
Pacific Islander	2	No			
White (not of Hispanic origin)	705	Yes	859	A	A
Socioeconomic ally Disadvantaged	420	Yes	709	5	714
English Learners	136	No			
Students with Disabilities	158	Yes	555	12	567

Demographic data for XYZ School (California Department of Education, 2009)

Appendix B:

Parental Informed Consent Form

Parental Informed Consent Form for Minors

October 2009

Dear Eighth Grade Parents:

As some of you know, I am currently a Master's degree candidate at CSU Channel Islands. As part of the program I am conducting research into the impact of using a familiar communication technology, blogging, during math instruction.

Purpose of the Study: The project will investigate student engagement in mathematics through the use of a classroom website and on-line blogging. I am interested in finding out if this communication tool will impact students' participation through their willingness to communicate mathematically, to ask questions, and assist students in developing a positive attitude toward mathematics. The long term effect is intended to be that students gain self-confidence and an improved self-concept of themselves as capable learners.

Participation and Procedures: I am asking for permission to use your child's online responses to surveys and blog responses during the course of this study. This involves the completion of a math attitude survey administered twice during the year, which will be administered during class time and take about 15 minutes to complete. At the end of two of the math lessons each week, students will respond on-line to questions that I pose related to the day's lesson content and standard. Students will explain solution strategies used and use mathematics academic language. Responses will be accessed by myself and other students in the group who will respond to each others' entries.

Risks and Benefits: By allowing your child to participate in the study, the potential benefits are that the information gathered may help her/him become aware of her/his attitudes towards math and how communicating with others using math vocabulary increases self-confidence and builds student self-esteem. There are no foreseeable risks or adverse effects to your child that may result from participation in this study.

Confidentiality: Your child's name will not be disclosed and any information that I use will be kept confidential and only disclosed with your permission or as required by law. Data I gather from online responses will be held electronically in a password protected website. The classroom website will be open only to our classroom and students will access the online blogs with protected passwords. Data will be compiled and reported only in aggregate form. Any written data I generate will be kept in a locked filing cabinet. Your child's name will not be disclosed in any reports or publications resulting from this study.

Participation and Withdrawal: If you do participate, you are free at any time to withdraw consent and discontinue your child's participation without prejudice or consequence.

Rights of Participants: You are not waiving any legal rights because of agreeing to allow your child participate in this study. Your decision to participate or not will not prejudice any future relationships with Balboa Middle School, Ventura Unified School District or California State University Channel Islands. If you have questions regarding your rights as a research participant, please contact the Office Research and Sponsored Programs at CSU Channel Islands at (805) 437-3285 or via email at irb@csuci.edu.

Contact Information: If you have any questions, please ask me. I can be reached at (805) 289-1800 ext 2180 or at kristin.haidet@venturausd.org. If you are willing to give your permission for the participation of your child in this study and for the use of information gathered from the surveys, web blogs and interviews, please sign below and return this form to your child's math teacher.

Thank you for considering this request.

Kristin Littlefield-Haidet

_____ _____
Parent or Guardian Signature Date

_____
Print your Child's Full Name

Your Child's Birth Date ___/____/_____

_____ _____
Signature of Researcher Date

Appendix C:

Pre-Project Questionnaire

Pre-Project Questionnaire

1. Do you know what a “blog” is? What do you know about blogs?

2. What kind of information do you want to talk about on your blog? *

3. What do you think the purpose of using blogs in an English class is? *

* Questions 2 and 3 were completed after the students were instructed on what a blog was.

Appendix D:

Pre-project Survey

Dutton's Attitude Scale (augmented by Kristin Haidet)

Directions: Place checks in either agree or disagree column depending upon which expresses your true feelings.

	Agree	**Disagree**
• Math makes me feel uneasy and confused		
• I don't fell sure of myself in mathematics.		
• I have never liked mathematics and it is my most dreaded subject		
• I like math, but I like other subjects just as well.		
• I like math because it is practical.		
• I don't think math is fun, but I always want to do well in it.		
• I have always enjoyed studying math in school.		
• Mathematics makes me uncomfortable.		
• I would like to develop my mathematical skills.		
• Math is very interesting, and I have usually enjoyed my classes in this subject.		
• I have always been afraid of math.		
• Math is less important to peoples than art or literature.		
• I detest math and avoid using it at all times.		
• An understanding of math is needed by artists and writers as well as scientist.		

• I avoid math because I am not very good with figures.		
• I enjoy doing problems when I know how to work them out.		
• Math is a very worthwhile and necessary subject.		
• I am afraid of doing word problems.		
• Math helps develop a person's mind and teaches him/her to think.		
• I have never liked mathematics.		
• Mathematics is not important in everyday lives.		
• There is nothing creative about mathematics; it's just memorizing formulas and things.		

Appendix E:

Results from Pre-project Questionnaire

Results of Pre-project Questionnaire

Response	Number of Students
Math	3
Hobbies	5
Personal experiences	6
Music	3
Movies	3
Family	1
The future	1
Something I'm interested in	5
Easy topics	1
Something new to me	2
Food	1
Something nobody knows	3

Appendix F:

Pre-Blog Classroom Assignment

Pre-Blog Classroom Assignment

For this class you are required to BLOG. A BLOG is an interactive online journal where you can write your thoughts, talk about issues, ask questions to your classmates and teacher, and use the computer to help you develop your skills. Blogs are a great way to keep up on your Math outside the class and to make a connection at home to what you are learning in class.

Every week you will BLOG twice a week to a prompt presented by the teacher or a classmate. Sometimes you will be able to "free-write." This means you can write about anything you like. Sometimes, your teacher will give you specific instructions about what topics to write about in your BLOG. These topics will be related to issues that we study about in class. You should make an effort to recycle vocabulary, expressions, and ideas that we discuss in class. This way you will be using the vocabulary that you study in class, and by using it you will have better chance or remembering it in the future.

On each BLOG, there is an opportunity to "comment." This means that if someone reads your BLOG, they can respond to it. You may want to ask them a question or tell them something positive about their BLOG. Please be positive in your comments and help your classmates by giving them good comments or by asking interesting questions.

This assignment is an out-of-class assignment, a homework assignment. You are expected to work on your BLOG outside of class. You can access your BLOG from any computer that has an Internet connection. If you have difficulties doing this, please discuss your situation with your teacher.

This BLOG assignment is worth homework points. Your teacher will be reviewing your BLOGS weekly and giving you feedback by commenting on your BLOGS. Your teacher will give you one mark (10%) on January and another mark (10%) on April.

Appendix G:

Blog Prompts

Self Efficacy

- Are you getting Math?
- What are the things I am doing in class that helps you understand Math? What do I need to do more of?
- How does math class make you feel? Have you always felt this way?
- How did mathematics make you feel in Elementary School?
- Sometimes adults view students differently then students view themselves. (Do you might think you are popular, or an athlete, bad at math, strong reader, etc...So tell me who you think you are. Make sure you answer all three questions, check your spelling and give at least three examples to support your response.)
- How do you view yourself as a student? How do you view yourself as a person? Who do you think you are?
- Do you feel motivated to be in this math class? Why or why not? What do you find to be motivating or what could the teacher do to help motivate you?

Attitude

- What do you prefer? Journal writes with pencil/paper or do you prefer to BLOG? Tell me why?
- What is your favorite experience in math from last semester? Please write at least a paragraph.
- Does mathematics scare you in any way? Please explain.
- My best experience with math was when.....
- Tell one of your favorite things about math class.

Performance

- How did you use math on Saturday? Give an example of how you used math.
- If you were the teacher what would you do differently?
- What do these words mean? How would you use them? Simple Interest, Principal, Rate
- If you were to explain to the 6th graders how to solve this problem, how would you do that using the above vocabulary words?
- When Nicole was born, her parents put $8,000 into a college fund account that earned 9% simple interest. Find the total amount in the account after 18 years.
- Tell me the definition of the Pythagorean Theorem in your own words? How would you use this?
- In the math test it seemed that I had difficulty when trying to solve quotient of powers. How could I stop from having this challenge when solving problems that involve quotient of powers? Ex: 12x to the third power/ 6x to the second power. Please write one paragraph to explaining how I could answer questions involving quotient of powers.
- How could we change blogging to make it become more effective?
- Tell me about the sub and what did you learn?

- Explain to your classmates what you do understand about Quotient of Powers and what you still need clarification on.
- What are some ways you use math outside of the classroom?
- How do you solve a 1 step equation that has a fraction? Ex: ½ x=26
- Please explain what the main idea of today's lesson?
- What is a proportion? Write everything you can about how to solve a proportion.
- Explain everything you know about solving one step equations. Ex: 5x-14=24
- I would like each of you to create your own math blog so; we can answer your questions/problems. Remember you need to use math vocabulary in solving these problems. You will respond to your friend's posts. You may pose a question or a math problem to your classmates. Blog on!
- Tell me how you subtract fractions with unlike denominators. What are the steps for solving the following fractions? Please try and use your math vocabulary words to help you explain how to solve these problems.

3/4

-1/2

- Today, you took a test on finding LCM, GCF, and reducing fractions. Explain some of your challenges and frustrations with the test.

Appendix H:

Post-project Survey

Post-project Survey

Dutton's Attitude Scale (augmented by Kristin Haidet)

Directions: Place checks in either agree or disagree column depending upon which expresses your true feelings.

	Agree	Disagree
• Math makes me feel uneasy and confused		
• I don't fell sure of myself in mathematics.		
• I have never liked mathematics and it is my most dreaded subject		
• I like math, but I like other subjects just as well.		
• I like math because it is practical.		
• I don't think math is fun, but I always want to do well in it.		
• I have always enjoyed studying math in school.		
• Mathematics makes me uncomfortable.		
• I would like to develop my mathematical skills.		
• Math is very interesting, and I have usually enjoyed my classes in this subject.		
• I have always been afraid of math.		
• Math is less important to peoples than art or literature.		
• I detest math and avoid using it at all times.		
• An understanding of math is needed by artists and writers as well as scientist.		

• I avoid math because I am not very good with figures.		
• I enjoy doing problems when I know how to work them out.		
• Math is a very worthwhile and necessary subject.		
• I am afraid of doing word problems.		
• Math helps develop a person's mind and teaches him/her to think.		
• I have never liked mathematics.		
• Mathematics is not important in everyday lives.		
• There is nothing creative about mathematics; it's just memorizing formulas and things.		

For the two questions below circle the number to show if you if agree of disagree.'

Circle:

1 if you strongly disagree
2 if you disagree
3 if you agree
4 if you strongly agree

1) I am a successful math student.

1_____2_____3_____4

Why?

2) I am motivated to learn the mathematics we are doing in class.

1_____2_____3_____4

Why?

For the two questions below circle the number to show if you if agree of disagree.

Circle:

1 very poor
2 not very good
3 good
4 excellent

3) How would you rate your performance in math classes **before** you began blogging?

1_____2_____3_____4

4) How would you rate your performance in math classes **after** you began blogging?

1_____2_____3_____4

Appendix I:

Summative Interview Guiding Questions

Summative Interview: Guiding Questions

Name:
Age:
Gender:

1. So, do you think you have been an effective math learner this year? Why?

2. What did you want to improve? Do you think you'll be successful in those improvements?

3. On a scale of 1-5, 5 being difficult and 1 being easy, how difficult did you find doing the blog project?

4. Did you enjoy the project? Why or why not?

5. What aspects did you dislike about the project?

6. How did you feel about your blogs?

7. How much time/effort did you put into the project?

8. Did you meet the requirements of the project?

9. Did you feel that you were communicating through journal (why/how/with who?)

10. Have you kept a journal blog before?

11. What do you think are the advantages of doing a blog?

12. How did you feel about other students' comments on your blog?

13. What did you learn from the project?

14. How can the project be better?

15. Will you continue writing on your blog in the future?

16. Do you think we should continue to Blog? Why?

17. Do you think you give better explanations with blogging/journaling or in person? Why?

18. Were you more inclined to do your homework when you were asked to blog? Why?

19. Do you think your homework scores improved? Why?

20. Did you find it difficult to blog regularly? Why?

21. Where did the blogging help you in math instruction and tests? Please give specific examples?

22. Did you enjoy blogging? Why or why not?

23. What do you think could have changed to make it easier or more challenging?

Appendix J:

Rubric for Analyzing Blog Responses

Rubric for Analyzing Blog Responses

OUTCOME ASSESSED	**Beginning**	**Developing**	**Proficient**	**SCORE**
	1	2	3	
Overall Use of Blogs	Few blog entries; simple retelling of personal events. Lacks structure and or flow. Entry appears to be hastily written often using informal language and or text style abbreviations	Almost all required blog entries and comments have been completed. Entries have some structure but lack consistent flow.	All blogs have entries. The journal entries have structure. The posts flow and have concrete examples with details.	
IntellectualEngagement with Key Concepts	Blog entries make no reference to the question. No key vocabulary words.	Blog entries make some reference to the question. Limited reference to key vocabulary.	Blog entries demonstrate awareness of most of the key issues of the question. Can identify key vocabulary words.	
Personal Response to Key Concepts	Blog entries show no personal response is made to the issues/concepts	Blog entries convey little evidence of a personal response to the issues/concepts includes an example	Blog entries convey evidence of a personal response to the issues good solid examples	
Engaged Writing	Blog entries use incorrect grammar and syntax consistently, making it difficult for others to follow.	Blog entries demonstrate some evidence of some incorrect spelling, grammar, punctuation, etc. Audience will have little trouble reading your blog.	Blog entries show a good command of Standard English. No problems for audience.	
Timeliness	Entries are irregular. Responded several days after posts	The entries have are posted 1-2 days after post	Entries are responded to night of the post.	

Appendix K:

Cooperating Institution Letter of Support

August 5, 2009

Office of Research and Sponsored Programs
CSU Channel Islands
One University Drive
Camarillo, CA 93012-8599

Dear Members of the Committee:

On behalf of Balboa Middle School, I am writing to formally indicate our awareness of the research proposed by Kristin Littlefield-Haidet, a student at CSUCI. I am aware that Ms. Littlefield-Haidet intends to conduct her research on classroom blogging in Mathematics - with a group of her 8th grade students. She will analyze data gathered through surveys that she will design and administer and from her and interview with students.

As the principal of Balboa Middle School and I am responsible for overseeing all matters related to student and employee relations. I give Kristin Littlefield-Haidet permission to conduct her research in our school.

If you have any question or concerns, please feel free to contact my office at (805) 289-1800 x1012. I am also reachable by email at teri.gern@venturausd.org.

Sincerely,

Teri Gern
Principal, Balboa Middle School

Appendix L:

IRB Approval Letter

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

Office of Research and Sponsored Program

Date: November 9, 2009
Kristin Littlefield, Principal Investigator
Subject: Study # G054036 Approval: Masters in Special Education

On October 15, 2009 the Institutional Review Board Chair of California State Channel Islands (CSUCI) reviewed your exempt/expedited category 1 research study. According to the policies and procedures of the Institutional Review Board (IRB) you may begin your investigation upon receipt of this notification. Approval is granted for **one year and your approval will expire on November 9, 2010.**

At the end of this period, as the principal investigator you must submit a status report to the IRB via email at: irb!ci;csUci.edu stating if your study has concluded (or otherwise terminated) or if you will need to amend or continue the study as originally approved.

As the principal investigator you will also need to:
1. Notify the IRB within 10 days if the research was terminated;
2. Promptly report to the IRB any changes in a research activity, proposed amendments, or unexpected reactions;
3. Promptly report to the IRB any unanticipated problems involving risks to subjects or others; and,
4. Notify the IRB Chair immediately after any adverse reactions are experienced by participants of the investigational study or as reported to you by the sponsor/manufacturer/co-principal investigators.

You may not initiate changes to the approved research protocol without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the human subjects. Should you have any questions please contact Amanda Quintero, Director for Research and Sponsored programs (805) 437-3285.

Sincerely,

Don Rodriguez, Institutional Review Board Chair

Appendix M:

Response to Pre-Survey Questions

Response to Pre-Survey Questions

Self Efficacy		**Pre**		**Post**	
		Agree	Disagree	Agree	Disagree
math makes me feel un easy and confused	**2**	2	7	22%	77%
I don't feel sure of myself in math	**3**	2	7	22%	77%
I have never liked math and dread it	**4**	1	8	11%	88%
Math makes me feel uncomfortable	**5**	1	8	11%	88%
I have always enjoyed studying math in school	**6**	6	3	66%	33%
I have always been afraid of math	**7**	2	7	22%	77%
I avoid math because I am not very good with figures	**15**		9		100%
I enjoy doing problems when I know how to work them out	**16**	9		100%	
I am afraid of doing word problems	**18**	7	2	77%	22%
Math helps develop a person's mind and teachers him or her to think	**19**	7	2	77%	22%
Attitude		**Pre**		**Post**	
		Agree	Disagree	Agree	Disagree
I like math, but I like other subjects just as well	**1**	9		100%	
I detest math and avoid using it at all times	**9**	2	7	22%	77%
Math is very interesting, and I have usually enjoyed my classes in this subject	**10**	8	1	88%	11%
Math is less important to peoples than art or literature	**11**	1	8	11%	88%
I like math because it is practical	**12**	8	1	88%	11%
An understanding of math is needed by artists and writers as well as scientist	**14**	8	1	88%	11%
Mathematics is not important in everyday lives	**17**		9		100%
I have never liked mathematics	**20**		9		100%
Math is very worthwhile and necessary subject	**21**	7	2	77%	22%
There is nothing creative about mathematics; it's just memorizing formulas and things	**22**	2	7	22%	77%
Performance		**Pre**		**Post**	
		Agree	Disagree	Agree	Disagree
I would like to develop my math skills	**8**	8	1	88%	11%
I don't think math is fun, but I always want to do well in it.	**13**	3	6	33%	66%