Culminating Experience Action Research Projects, Volume 12, Spring 2008

Edited by

Deborah A. McAllister and Sharon R. Deaver

August 19, 2008

College of Health, Education, and Professional Studies
The University of Tennessee at Chattanooga

Introduction

As a part of the teacher licensure program at the graduate level at The University of Tennessee at Chattanooga (UTC), the M.Ed. Licensure candidate is required to complete an action research project during a 3-semester-hour course that coincides with the 9-semester-hour student teaching experience. This course, Education 590 Culminating Experience, requires the student to implement an action research plan designed through (a) the Education 500 Introduction to Inquiry course, (b) one of the two learning assessments required during student teaching, or (c) a newly-designed project not used as one of the learning assessments.

With funding through a UTC Teaching, Learning, and Technology Faculty Fellows award, the Education 590 course is conducted through the use of an online, course management system (Blackboard Learning System Release 6), allowing for asynchronous discussion and use of the digital drop box feature for submitting required papers.

The course syllabus for Education 590 Culminating Experience is presented in the next section, followed by action research projects from spring semester 2008.

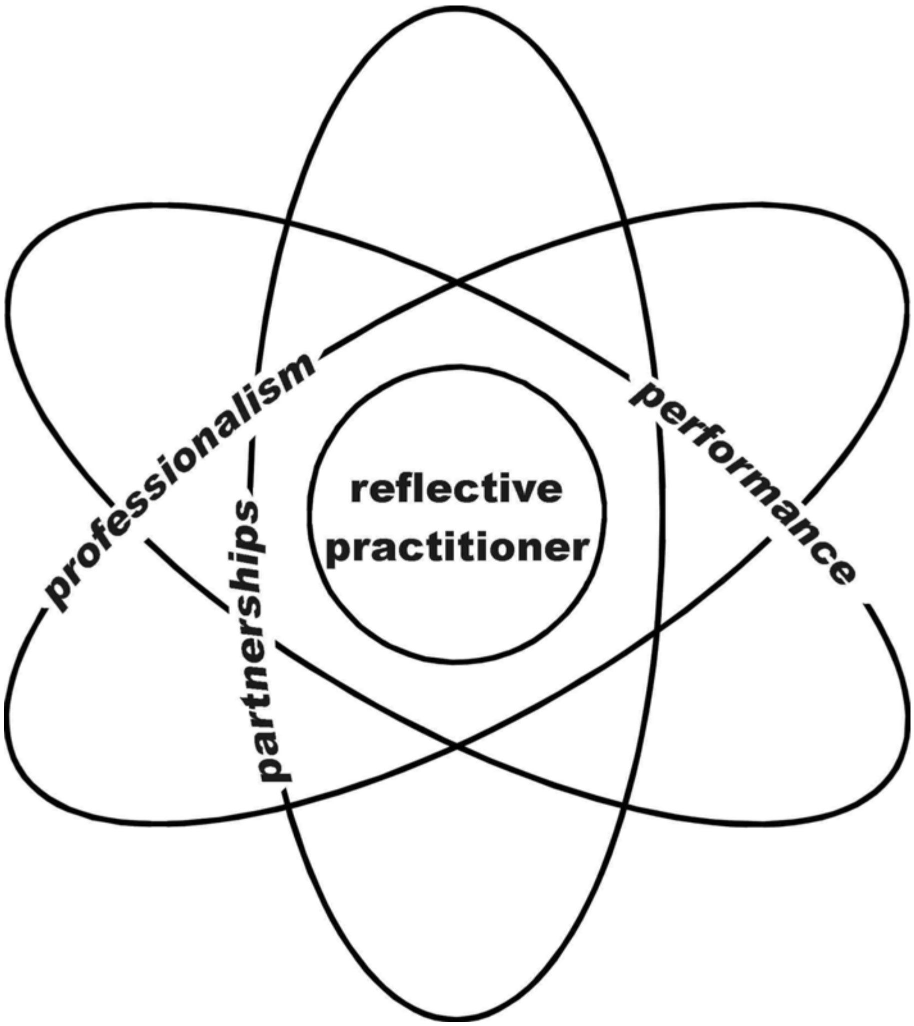
Deborah A. McAllister

Sharon R. Deaver

August 2008

Table of Contents

Educ 590 Culminating Experience
Spring 2008
Section 001, By Appointment, 3 credit hours



ATTENTION: If you are a student with a disability (e.g., physical, learning, psychiatric, etc.) and think that you might need assistance or an academic accommodation in this class or any other class, contact the Office for Students with Disabilities at 423-425-4006 or come by the office, 110 Frist Hall.

To enhance student services, the University will use your UTC email address (firstname-lastname@utc.edu) for communications. (See http://onenet.utc.edu/ for your exact address.) Please check your UTC email on a regular basis. If you have problems with accessing your email account, contact the Help Desk at 423-425-4000.

Educ 590 Culminating Experience – Spring 2008
Section 001, By Appointment, 3 credit hours

Instructor

Dr. Deborah A. McAllister
Office: Hunter 310C
Office hours: M 10:00 a.m. to 5:00 p.m. and Tu 1:00 p.m. to 4:00 p.m., or by appointment
Phone: 423-425-5376 (Office), 423-842-1607 (Home)
Email: Deborah-McAllister@utc.edu
Web site: http://oneweb.utc.edu/~deborah-mcallister/
Graduate Assistant: Sharon Deaver

Catalog description

Directed research or development project under faculty supervision. *Prerequisites: Admission to candidacy, approval of M.Ed. committee, EDUC 500 or EDUC 501. Co-requisite: EDUC 596.*

Recommended text and Web sites

American Psychological Association. (2001). *Publication manual of the American Psychological Association* (5th ed.). Washington, DC: Author.

The OWL at Purdue. (2007). *APA formatting and style guide.* Retrieved December 4, 2007, from http://owl.english.purdue.edu/owl/resource/560/01/

Degelman, D., & Harris, M. L. (2007). *APA style essentials.* Retrieved December 4, 2007, from http://www.vanguard.edu/faculty/ddegelman/index.aspx?doc_id=796

University of Wisconsin - Madison Writing Center. (2006). *Writer's handbook: APA documentation style.* Retrieved December 4, 2007, from http://www.wisc.edu/writing/Handbook/DocAPA.html

Objectives

1. The student can apply a variety of research strategies for use in the elementary, middle grades, and/or secondary classroom, or with professionals in the field. Reflective decision making, a process involving reading, reflecting, and responding, will be applied by the student to evaluate ongoing research techniques, procedures, and materials, in order to become a reflective practitioner.
2. The student will select or design surveys and/or rubrics for data collection in the content area.
3. The student will understand current issues in the content area, including current research methods, materials, professional development and grant opportunities, and programs suitable to all learners, from exceptional populations to diverse ethnic and cultural groups.
4. The student will demonstrate the ability to connect new learning with prior knowledge and skills through a case study conducted during the Induction Experience (Educ 596) or the Professional Teaching Experience (Educ 591).

Requirements

1. Select a case study option:
   a. Implementation of the project designed in Educ 500 as your case study. Include modifications to the project, if necessary, based on knowledge gained since the completion of Educ 500.
   b. Plan to use one of your learning assessments from your first or second placement as your case study.
   c. Design a new project of your own choosing.

2. **Prior to data collection, complete the REQUIRED process for UTC's Institutional Review Board For the Protection of Human Research Subjects (http://www.utc.edu/~instrb/ or http://www.utc.edu/Administration/InstitutionalReviewBoard/). Request either an Exemption from IRB Review (Form A) if your sample includes only adults, or an Expedited Review (Form B), if your sample includes children. Form C must be completed at the end of the study; I will send that electronically. Review the information and forms on the IRB Web site for additional details. There are sample forms posted on Blackboard. An Exemption requires approximately 1 week to process. An Expedited Review may require several weeks to process. (Full board approval is required if there is more than minimal risk to the subject.) Any updates to the IRB process will be followed. Submit all documents to me ELECTRONICALLY through the digital drop box on Blackboard. I will send the proposal to Dr. John Freeman, Graduate Studies Division Department Head, and copy it to you, after approving your documents for submission. You must receive approval for your project from Dr. Freeman and/or the IRB Committee. Use only the versions of the documents that I have copied to you.**

   The following statement must appear on Form B, in the Risks section (modify for Form A):

   There are no risks to students as the research methods are traditional educational practices. Students may discontinue their participation in the project, at any time, without penalty.

   The following statement must appear on Form B, in the Privacy section (modify for Form A):

   Data will be anonymous and confidential, and results will be reported as group scores and trends.

   Also include a statement, similar to the following:

   All data will be paired by name and random code number, and the names will be removed after the documents have been sorted for each student. I will store all records, including consent forms, for 7 years, and then destroy all records.

Your instrument(s), consent form, and/or assent form MUST contain the following statement:

THIS PROJECT HAS BEEN REVIEWED BY THE INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS AT THE UNIVERSITY OF TENNESSEE AT CHATTANOOGA.

Your consent and assent forms must include contact information for Dr. McAllister and Dr. Freeman, and must contain an option for the participant to discontinue participation as a research subject with no penalty. (Students are still required to complete course work.)

> Participation in this study is voluntary. You may discontinue your participation in the project at any time. Your decision whether or not to participate in the project or to withdraw from the project at any time will in no way affect your academic standing in this course. If you do choose to participate in the study, your participation will be completely anonymous. No one reading the results of the research will be able to identify you. (Reword “you” as “the student,” etc., for the parental consent form.)
>
> If you have any questions about the project, you may contact me at xxx-xxx-xxxx, Dr. Deborah McAllister, project advisor, at 423-425-5376, or the Department Head of the Graduate Studies Division at The University of Tennessee at Chattanooga, Dr. John Freeman, at 423-425-5446.

You must include a memo (preferably, an email attachment) from the school principal that you have permission to carry out the project.

If there is evidence of prior research that you have done or evidence stated in the literature for your project, place that on the IRB approval form (a sentence or two). If not, cite the HCDE or other standards that are addressed by your project so the IRB members know why you are teaching/investigating the topic.

Check the IRB’s Review Status link and your email account for updates on your proposal. Send a copy of any correspondence to me. I will submit any revisions, after discussing them with you.

3. Implementation of the project will be completed during the Induction Experience (Educ 596) or the Professional Teaching Experience (Educ 591). Implementation **cannot** occur prior to IRB approval.

4. Completion of the written project, **in APA style**. Include the following elements, each of which should be centered at the top of that section of the paper (not italic, not bold; see p. 113 in the APA style manual, and the sample headings document posted on Blackboard):

a. Introduction to the Problem. Why was this topic selected for study? Is this topic a current national, state, or local issue? Is this topic a staple of the curriculum in your field? Etc.

b. Review of Literature. Use at least five refereed sources. The online Education Resources Information Center (ERIC) advanced search should be used to locate references in educational journals and documents. See ERIC (http://www.eric.ed.gov/) and/or select the link to the advanced search. **You must use a page number or a paragraph number for all direct quotes. All references should contain complete page numbers (not the first page only, as may be listed in online documents).**

c. Data Collection and Results. Describe data collection procedures. Provide results of the project, in narrative form and including a chart and/or graph to display the data collected. Analysis of results is from the perspective of higher order cognitive skills. Use descriptive statistical measures (mean, median, mode, frequency distribution, charts, graphs, etc.) for communication of project results. Charts and graphs are imported from Excel to Word and cited as figures (not tables). See Microsoft Excel [spreadsheet] software, used in Educ 575.

d. Conclusions and Recommendations. What generalizations, if any, can be made, based on the results of the case study? What is the consensus of your professional organization with regard to the problem studied? What recommendations would you make for teacher professional development? Is grant money available to support further research in this area? What role could be assumed by the use of technology in this area? **Please address all items in this section.**

e. Copies of the instrument(s) used for data collection. Place original instruments in individual appendices. Do not include published instruments from the Web, books, etc., but place a citation on the page that mentions an instrument and in the reference list.

5. Communication:
   a. Current email address registered with UTC for communication between student and instructor. The UTC email address will point to the email address you have on file. See http://itd.utc.edu/email/ for more details.
   b. Web access to check course announcements and post messages to the discussion forum on Blackboard a minimum of once per week. See http://utconline.utc.edu/ or http://bb2.utc.edu/webapps/login/.

6. All work is to be computer-generated and turned in through the Blackboard digital drop box. You may complete your project either on the Macintosh or Windows platform. Please use Microsoft Word and Microsoft Excel. If other software is to be used, please ask for approval. Keep a copy of your work on a hard drive or a disk so that it can be accessed, if needed. Reminder: You will need a student ID card to use the student computer lab in the University Center.

7. Please note:
   a. Ask another person to proofread your work for correct syntax and semantics before submitting it. You may post it to the Blackboard discussion forum.

b. The Writing Center is located in 119 Holt Hall. See http://www.utc.edu/~scribble/ for hours and information.

c. Case studies may be displayed at a professional meeting and/or gathered for a publication.

8. Previously published student papers:

McAllister, D. A., & Fritch, S. C. (Eds.). (2007). *Culminating experience action research projects, volume 8, part 1, spring 2006*. (ERIC Document Reproduction Service No. ED495484)

McAllister, D. A., & Fritch, S. C. (Eds.). (2007). *Culminating experience action research projects, volume 7, fall 2005*. (ERIC Document Reproduction Service No. ED495261)

McAllister, D. A., & Bothman, S. M. (Eds.). (2005). *Culminating experience action research projects, volume 6, fall 2004*. (ERIC Document Reproduction Service No. ED490689)

McAllister, D. A., & Bothman, S. M. (Eds.). (2005). *Culminating experience action research projects, volume 5, spring 2004*. (ERIC Document Reproduction Service No. ED490030)

McAllister, D. A., & Bothman, S. M. (Eds.). (2005). *Culminating experience action research projects, volume 4, fall 2003*. (ERIC Document Reproduction Service No. ED490668)

McAllister, D. A., & Moyer, P. S. (Eds.). (2003). *Culminating experience action research projects, volume 3, spring 2003*. (ERIC Document Reproduction Service No. ED481396)

McAllister, D. A., & Moyer, P. S. (Eds.). (2002). *Culminating experience action research projects, volume 2, fall 2002*. (ERIC Document Reproduction Service No. ED474071)

McAllister, D. A., Moyer, P. S., & Bothman, S. M. (Eds.). (2005). *Culminating experience action research projects, volume 1, spring 2002*. (ERIC Document Reproduction Service No. ED490720)

Grading rubric

Criteria	A	B	C	F
Project outline and IRB approval	Submitted online. Submitted for IRB approval; approval received.	Submitted online. Submitted for IRB approval; approval received.	Submitted online. Submitted for IRB approval; approval received.	Not submitted online. Not submitted for IRB approval, or IRB approval denied.
Instruments	Items appear to be reliable and valid for the case study.	Items appear to be reliable and valid for the case study.	Reliability or validity is questionable.	Reliability and validity cannot be defended.
Data collection and results	Narrative gives descriptive account of data collection and results, and higher order analysis of results; data chart and graph display results accurately and appropriately.	Narrative provides descriptive account of data collection and results, but analysis of results is weak; data chart and graph display results satisfactorily.	Narrative provides limited descriptive account of data collection and results; analysis of results is flawed; data chart and graph display results, but contain errors.	Neither narrative nor chart and graph convey the data collection procedures and results of the study.
Conclusions and recommendations	Provides a cohesive summary to the project; all recommendation areas addressed satisfactorily.	Provides a cohesive summary to the project; most recommendation areas addressed satisfactorily.	Summary lacks insight to the intent of the project; recommendation areas not completely addressed.	Conclusions do not reflect results; recommendation areas not completely addressed.
APA style	APA style elements present: headings, subject-verb agreement, citations, references, abbreviations, commas, semicolons, lists, tables, figures, appendices, etc.	APA style elements present, with minor errors.	Ideas are understandable; acceptable writing style, though not APA.	Written style is inconsistent; difficult to follow the flow of ideas.
Spelling and typographical errors	No spelling errors; minimal typographical errors; correct use of plural and possessive forms.	Spelling and typographical errors present.	Errors detract from quality of project.	Poorly written.
Completion time	All elements completed on time.	Major elements completed on time; some minor elements late.	Most major elements completed late; some or most minor elements late.	No time deadline.
Communication	Open communication between student and instructor. Progress message posted to the discussion forum at least weekly.	Response time is less than once each week.	Response time is less than once in 2 weeks	Response time is less than once in 4 weeks.
Professional quality and usefulness	Previous and current suggestions, and modifications, fully incorporated into project outline; project is relevant to education.	Previous and current suggestions, and modifications, selectively incorporated into project outline; project is relevant to education.	Previous and current suggestions, and modifications, minimally incorporated into project outline; project is relevant to education.	Previous and current suggestions, and modifications, not incorporated into project outline; project has little relevance to education.
Represents graduate level work	Completed project is presented as a coherent whole.	All project elements present but project is not presented as a coherent whole.	One or more project elements missing; project is not presented as a coherent whole.	Major project elements missing; project is not presented as a coherent whole.

Week (Tentative course schedule, subject to change.)		**Assignment due**
1	Week of 01/07/08 (and prior meeting 12/04/07) M 01/07, Student teacher meeting; W 01/09, 1st placement begins Educ 590 will meet 01/07.	Check email account; access Blackboard.
2	Week of 01/14/08 Case study option selected; proposed outline posted to discussion forum. **Paperwork submitted for IRB approval. Instruments and letter of approval from school principal must be included with both Form A and Form B. Parental consent form and student assent form must be included with Form B. Participant consent form must be included with Form A.** Copy of IRB approval placed in my mailbox in Hunter 311, when received, if not sent by email.	
3	Week of 01/21/08; MLK Holiday, M 01/21 (UTC/HCDE) Begin case study work on introduction, review of literature, and instruments; place file in digital drop box for review and for a check of APA style.	
4	Week of 01/28/08	Begin data collection, with IRB approval.
5	Week of 02/04/08	Case study work continues.
6	Week of 02/11/08	Case study work continues.
7	Week of 02/18/08	Data collection is complete.
8	Week of 02/25/08; Th 02/28, Student teacher meeting	1st placement ends 02/29
9	Week of 03/03/08; Second placement begins	Writing of case study.
10	Week of 03/10/08; Spring break, M 03/10 – F 03/14 (UTC)	Writing of case study.
11	Week of 03/17/08; Spring break, M 03/17 – F 03/21 (HCDE) Spring Holiday, F 03/21 (UTC)	Writing of case study.
12	Week of 03/24/08	Writing of case study.
13	Week of 03/31/08	Writing of case study.
14	Week of 04/07/08;	Proofreading of case study.
15	Week of 04/14/08	**Completed case study due, Sa 04/19/08, 12:00 p.m. (noon)** **Case study assembled in a single file; placed in digital drop box.**
16	Week of 04/21/08; Second placement ends, M 04/21; Student teacher meeting, Tu 04/22	**Late case studies accepted.**

17 Week of 04/28/08; Th 05/01, Grades due, 12:00 p.m.; Su 05/04, Commencement, 2:00 p.m.

Late case studies accepted; not guaranteed to be graded by 05/01.

APA style (general guidelines; use reverse indent)

1. Journal

Last name, Initials., & Last name, Initials. (year). Title of the article in lower case letters except first letter of the title and proper nouns. *Journal name, volume*(number), page number-page number.

Many, W., Lockard, J., Abrams, P., & Friker, W. (1988). The effect of learning to program in Logo on reasoning skills of junior high school students. *Journal of Educational Computing Research, 4*(2), 203-213.

2. Book

Last name, Initials., & Last name, Initials. (year). *Title of the book in lower case letters except first letter of the title and proper nouns.* Place of publication: Publishing Company.

Turner, T. N. (1994). *Essentials of classroom teaching elementary social studies.* Needham Heights, MA: Allyn and Bacon.

3. Software

Last name, Initials., & Last name, Initials. (year). *Title of the Software in Upper Case First Letters* [Computer software]. Place of publication: Publishing Company.

Microsoft Corporation. (1996). *Encarta 97 Encyclopedia* [Computer software]. Redmond, WA: Author.

In example 3, the author and the publishing company are the same, so the word ‘Author’ is used.

4. Online source

Last name, Initials., & Last name, Initials. (year). *Title of the Web site in lower case letters except first letter of the title and proper nouns*. Retrieved today’s date, from complete URL

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Retrieved December 4, 2007, from http://standards.nctm.org/

In example 4, I omit the period ‘.’ at the end so it will not be confused in the address. Others choose to leave one space, then place the period at the end of the URL.

5. ERIC document

Last name, Initials., & Last name, Initials. (year). *Title of the paper in lower case letters except first letter of the title and proper nouns.* Paper presented at name, place, and date of conference, or other relevant information. (ERIC Document Reproduction Service No. XXXXXX)

McAllister, D. A., Mealer, A., Moyer, P. S., McDonald, S. A., & Peoples, J. B. (2003). *Chattanooga math trail: Community mathematics modules, volume 1*. Washington, DC: U.S. Copyright Office. (ERIC Document Reproduction Service No. ED478915)

Professional Organizations (examples)

American Council on the Teaching of Foreign Languages. (n.d.). Retrieved December 4, 2007, from http://www.actfl.org/

Council for Exceptional Children. (2007). Retrieved December 4, 2007, from http://www.cec.sped.org/

International Reading Association. (2007). Retrieved December 4, 2007, from http://www.reading.org/

International Society for Technology in Education. (n.d.). Retrieved December 4, 2007, from http://www.iste.org/

National Art Education Association. (2007). Retrieved December 4, 2007, from http://www.naea-reston.org/

National Association for Music Education. (n.d.). Retrieved December 4, 2007, from http://www.menc.org/

National Association for the Education of Young Children. (n.d.). Retrieved December 4, 2007, from http://www.naeyc.org/

National Council for the Social Studies. (n.d.). Retrieved December 4, 2007, from http://www.ncss.org/

National Council of Teachers of English. (2007). Retrieved December 4, 2007, from http://www.ncte.org/

National Council of Teachers of Mathematics. (2007). Retrieved December 4, 2007, from http://www.nctm.org/

National Middle School Association. (2007). Retrieved December 4, 2007, from http://www.nmsa.org/

National Science Teachers Association. (2007). Retrieved December 4, 2007, from http://www.nsta.org/

Rubrics (examples)

Chicago Public Schools. (2000). *The rubric bank.* Retrieved December 4, 2007, from http://intranet.cps.k12.il.us/Assessments/Ideas_and_Rubrics/Rubric_Bank/rubric_bank.html

Chicago Public Schools. (2000). *How to create a rubric.* Retrieved December 4, 2007, from http://intranet.cps.k12.il.us/Assessments/Ideas_and_Rubrics/Create_Rubric/create_rubric.html

LessonPlanZ.com. (2005). Retrieved December 4, 2007, from http://lessonplanz.com/ (use 'rubric' as a search term)

South Dakota State University. (n.d.). *Rubric template.* Retrieved December 4, 2007, from http://edweb.sdsu.edu/triton/july/rubrics/Rubric_Template.html

Teachnology. (n.d.). Rubric, rubrics, teacher rubric makers. Retrieved December 4, 2007, from http://teachers.teach-nology.com/web_tools/rubrics/

The Landmark Project. (n.d.). *Rubric construction set.* Retrieved December 4, 2007, from http://landmark-project.com/classweb/rubrics/4x4rubric.html

Surveys (examples)

The International Consortium for the Advancement of Academic Publication. (2007). *Resources for methods in evaluation and social research.* Retrieved December 4, 2007, from http://gsociology.icaap.org/methods/

University of Southern Indiana Sociology Department. (2007). *Social research and statistical links.* Retrieved December 4, 2007, from http://www.usi.edu/libarts/socio/stats.htm

Bibliography

American Association for the Advancement of Science. (1993). *Benchmarks for science literacy*. Retrieved December 4, 2007, from http://www.project2061.org/tools/benchol/bolintro.htm

Association of College and Research Libraries. (2005). *Information literacy competency standards for higher education*. Retrieved December 4, 2007, from http://www.ala.org/acrl/ilstandardlo.html

Creswell, J. W. (2005). *Research design: Planning, conduction, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Pearson Education, Inc.

Fogarty, R. (1995). *The mindful school: How to integrate the curricula awareness program.* Palatine, IL: IRI/Skylight Training and Publishing, Inc.

Freiberg, H. J., Driscoll, A., & Stetson, R. H. (1992). *Universal teaching strategies.* Boston, MA: Allyn and Bacon.

Gay, L. R., & Airasian, P. (2003). *Educational research: Competencies for analysis and applications* (7th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Hamilton County Department of Education. (2005). *HCDE standards and benchmarks*. Retrieved December 4, 2007, from http://www.hcde.org/standards/stindex.html

Johnson, A. P. (2005). *A short guide to action research* (2nd ed.). Boston, MA: Pearson Education, Inc.

Leedy, P. D., & Ormrod, J. E. (2005). *Practical research: Planning and design*. Upper Saddle River, NJ: Pearson Education, Inc.

Martin, D. B. (1999). *The portfolio planner.* Upper Saddle River, NJ: Prentice-Hall, Inc.

McAllister, D. A. (2006). *Faculty page – McAllister*. Retrieved December 4, 2007, from http://oneweb.utc.edu/~deborah-mcallister/

McMillan, J. H., & Schumacher, S. (2001). *Research in education* (5th ed.). New York, NY: Addison Wesley Longman, Inc.

Menges, R. J., & Weimer, M. (1996). *Teaching on solid ground: Using scholarship to improve practice.* San Francisco, CA: Jossey-Bass Inc.

Mills, G. E. (2003). *Action research: A guide for the teacher researcher* (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Mills, S. C., & Roblyer, M. D. (2003). *Technology tools for teachers: A Microsoft Office tutorial.* Upper Saddle River, NJ: Pearson Education, Inc.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Retrieved December 4, 2007, from http://standards.nctm.org/

National Research Council. (1999). *How people learn.* Washington, DC: National Academy Press. (see also http://www.nap.edu/readingroom/books/howpeople1/notice.html)

National Research Council. (1995). *National science education standards*. Retrieved December 4, 2007, from http://www.nap.edu/readingroom/books/nses/

Novak, J. D., & Gowin, D. B. (1984). *Learning how to learn.* New York, NY: Cambridge University Press.

Palloff, R. M., & Pratt, K. (2001). *Lessons from the cyberspace classroom: The realities of online teaching.* San Francisco, CA: Jossey-Bass Inc.

Provenzo, E. F., Jr. (2002). *The Internet and the World Wide Web for teachers.* Needham Heights, MA: Allyn & Bacon.

Reed, A. J. S., & Bergemann, V. E. (2001). *A guide to observation, participation, and reflection in the classroom* (4th ed.). New York, NY: McGraw-Hill.

Roblyer, M. D. (2003). *Integrating educational technology into teaching* (3rd ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Roblyer, M. D. (2003). *Starting out on the Internet: A learning journey for teachers* (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Tennessee Department of Education. (n.d.). *Curriculum standards*. Retrieved December 4, 2007, from http://www.state.tn.us/education/ci/standards/

Thomas, R. M. (2005). *Teachers doing research: An introductory guidebook*. Boston, MA: Pearson Education, Inc.

Treffinger, D. J., Hohn, R. L., & Feldhusen, J. F. (1979). *Reach each you teach.* Buffalo, NY: D. O. K. Publishers, Inc.

Tuckman, B. W. (1999). *Conducting educational research* (5th ed.). Fort Worth, TX: Harcourt Brace & Company.

U.S. Department of Education, Institute of Education Sciences. (n.d.). *Education resources information center*. Retrieved December 4, 2007, from http://www.eric.ed.gov/

Items available in Lupton Library

Campbell, L., Campbell, B., & Dickinson, D. (1996). *Teaching and learning through multiple intelligences.* Needham Heights, MA: Allyn and Bacon.

Haladyna, T. M. (1997). *Writing test items to evaluate higher order thinking.* Boston, MA: Allyn and Bacon.

Krulik, S., & Rudnick, J. A. (1995). *The new sourcebook for teaching reasoning and problem solving in elementary schools.* Boston, MA: Allyn and Bacon.

Ross, S. M., & Morrison, G. R. (1995). *Getting started in instructional technology research.* Washington, DC: Association for Educational Communications and Technology.

Silberman, M. L. (1996). *Active learning: 101 strategies to teach any subject.* Boston, MA: Allyn and Bacon.

Wilson, B. G. (Ed.). (1996). *Constructivist learning environment: Case studies in instructional design.* Englewood Cliffs, NJ: Educational Technology Publications.

Maintaining Classroom Control Despite Interruptions

Jennifer Livaudais-Barnes

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-103.

Abstract

The purpose of this paper is to share the results of a study that focused on controlling the attention of a class of kindergarteners while a child with learning or other disabilities was having an outburst or other disruptive behavior.

Introduction to Problem

While teaching in a kindergarten class, I realized how distracting one student could be to the rest of the class. I would be at the front of the classroom trying to explain something, while a child in the class, who has learning disabilities, would have an outburst and disrupt the entire group. I quickly realized that the other students would follow his lead. Being that the children are only 5 and 6 years of age, they don’t understand why one child screams out or cries, at the drop of a hat. They think, that since that child was not punished, and received attention, that they can act that way, as well. The problem quickly accelerated, as the year progressed.

This project is a 6-week action research study to see if the teacher can control the class while a child with a disability is having an outburst. The problem is that, once one child reacts to the negative behavior, they all do. As a teacher, I need to know how to keep the control in the classroom. The study will include a teacher and a class of 22 kindergarten students, with 4 inclusion students. The teacher will introduce different disabilities to the class, through books, in order to teach the children understanding and empathy of students with disabilities.

Review of Literature

I researched topics which I wish to use to change the behavior of the students in the kindergarten class. This included modeling and teaching empathy. The first set of writers conducted a study with 39 kindergarten students in three different schools. The control group consisted of 42 children in the same classes as the study group. The study consisted of measuring empathy, moral autonomy, judgment, and the recognition of emotion. The part of the study that measured empathy was introduced to the children by discussing, hypothetically, whether or not to buy a dog for a friend whose dog had recently died. The study subjects were also told a story about a butterfly with a torn wing. The children in the story are sad, and empathize with the butterfly by telling it a story of how one of the girl's doll had its arm ripped off by a mean girl. The study was split into a pre-test that was given in October and a post-test that was given in April. The outcome of the study showed that there was an increase in empathy in the study group. Empathy can be increased in kindergarten students if they are given the opportunity to learn it. The control group's level of empathy did not change from the pre-test to the post-test (Schleifer, Daniel, Peyronnet, & Lecomte, 2003).

The second set of writers conducted a study that taught empathetic responses using literature. The study was conducted with a class of high school seniors. The class consisted of 25 students, 23 of Caucasian decent and 2 of Hispanic decent. The goal of the study was to develop empathetic responses from children by reading multicultural literature. The study lasted 6 weeks. There were two types of empathy that the students developed over the course of this study, cognitive and historical empathy (Louie, 2006).

The third set of researchers tried to correct the negative behavior of a child with disabilities in a classroom. The teacher tried to correct his behavior several times, but the unwanted behavior got increasingly worse over a 2-week period. After conducting research, there were several different plans of action. The child was given a "buddy" that he would be paired with; the "buddy" would model appropriate behavior that the child should follow. The study lasted 14 days. Over the course of the intervention, the child's behavior improved 100 percent (Schoen & Thomas, 2006).

The fourth set of writers discussed the different ways to help children develop social skills. The article states that teachers should demonstrate, explain, role-play, and practice using the behavior, themselves, in order to help students learn the wanted behavior. In order to maintain a certain behavior in the classroom, they must model the wanted behavior themselves (Salend & Sylvestre, 2005).

The fifth article discussed a way to self-model in order to correct unwanted behavior. In this study, the intervention consisted of using a video of an autistic child's behavior as a form of modeling. Over the course of 4 weeks, the researcher videotaped the autistic boy. He was a 13-year-old, eighth grader with autism. He showed both good and bad behavior in the classroom setting. After the videotaping was complete, the researcher decided that the student needed to see his behavior in both ways, good and bad. The researcher edited the videotape and separated the good behavior from the bad so that the student could see all good behavior on the "Way To Go" tape and all the bad behavior on the "Oh No" tape. After viewing the tapes, the student wanted to take the tapes home to show his mother. His mother said that the student watched the tapes repeatedly. If he started to act up, his mother could ask him if he remembered the "Way To Go" tape, and if he could make his body look like that. After she said that to him, he would calm down and improve his behavior. His classroom teacher said that his behavior problems decreased significantly, but did not go away completely (Graetz, Mastropieri, & Scruggs, 2005).

Data Collection and Results

Data Collection

Area of Focus Statement

The purpose of this study is to describe the effects of empowering students to appropriately handle the unusual behaviors of students with learning disabilities or other disabilities in a kindergarten inclusion classroom through general classroom management and literature.

Variables

Demographic. There are 22 children in the classroom (11 boys and 11 girls).

Experimental. The lessons are about disabilities (through books teaching empathy) and modeling of appropriate behavior.

Research Questions

1. How do I maintain control and focus on the entire class when a child with disabilities is having an outburst?
2. How do I educate the rest of the class about disabilities that some children have?

Action Plan

Intervention. I will educate children about different disabilities that are present in our room and school, teaching them empathy and understanding. I will do this through different books aimed at educating children about what it is like to have different disabilities and how to live with them.

After surveying the children, I will be able to see how much they understand about why students are different and why some may act out with inappropriate behaviors. I will try to explain how everyone is different and communicates differently; that, even though we are different, we all have feelings that we need to express, but may not know how. I will read books to the children that help to explain the different needs of different people. The books are listed below:

- *Special People, Special Ways* by Arlene Maguire.
- *Daniel's World: A Book about Children with Disabilities* by Kathleen DeLoach.

- *Someone Special, Just Like You* (An Owlet Book) by Tricia Brown and Fran Ortiz.
- *Be Quiet, Marina!* by Kirsten DeBear and Laura Dwight.

After reading the books to the children, I will ask them if they have any questions. I will answer them honestly so that they understand. I will model the way they should react toward outbursts from students. If I demonstrate to the children how to ignore the inappropriate behavior, then they will learn how to respond appropriately.

Data collection. The teacher/researcher will conduct interviews with the children during regular, private discussions to see how they feel about disruptions that take place in the classroom. After the intervention, the teacher will interview the students again to see how they feel about any disruptions that take place in the classroom. The teacher/researcher will survey the students who were given permission to participate in the study, asking questions like, “Do you feel uncomfortable or upset when a classmate disrupts class?” (See Appendix A.)

The teacher will also observe the class when a child with disabilities is having an outburst, to view how the class, as a whole, reacts to the outburst.

Resources. Resources include permission slips, surveys to take notes on children’s attitude toward children who have outbursts, and child-friendly books about disabilities and differences.

Results

The results showed that students can be taught empathy towards others. Of the 18 students that were given permission to participate, 16 of them stated that the children that have outbursts do not bother them as much because now they understand why they scream out or cry. Many of the students retold what they had heard read to them, that many students who have disabilities cannot control their voice. Many of the children were more willing to help, if a student had an outburst. If one of the students, who was in a wheelchair, screamed out, then they would try to console the student by giving her something with which to play. The students were very receptive to the different types of disabilities that were present in the room. Through their actions, they showed that they could ignore the student who has ADHD while trying to help the student with Cerebral Palsy. The students would mimic the teacher/researcher when she would ignore the student who had ADHD and was acting out for attention purposes. They would also mimic the concern shown to a student with Autism.

Conclusions and Recommendations

Conclusions

In general, it is apparent that empathy can easily be taught to young children, if the time is taken to do so. After conducting the study, it is clear that empathy toward others can be taught to young children. Of the students who were given permission to participate in the study, all but one showed growth in empathy. The children started to show more concern for their friends who have disabilities. Some children tried to console others who were upset or shouting out. They learned that their behavior was uncontrollable, and that they were trying to communicate with the rest of the group. Sixteen children answered the survey differently at the end of the study, showing more empathy toward others. Not only did they show a change in attitude, but also they showed a change in their actions.

Recommendations

I would recommend that every teacher, whether they have inclusion students or not, try to teach empathy in their classroom. The change of attitude that the students had was remarkable. Students are very receptive, and are willing to learn about things of which they are unsure. Since technology is not needed to facilitate this study, it can be easily implemented in any classroom.

The consensus of the professionals at the school, with regard to the problem studied is that it is a beneficial study for not only the students, but by all parties involved. The professionals involved were amazed at the change in attitude that the students had toward others. The attitudes of the professionals changed, as well as those of the students. I would recommend that, for teacher professional development, all elementary teachers read to their students the books that were read in this study, as well as any others that explain the differences in people. No grant money was found for further research in this area. There is not a need for large quantities of money to continue research. The books that were read in this study were checked out from a local library.

References

Brown, T., & Ortiz, F. (1982). *Someone special, just like you* (An Owlet Book). New York, NY: Henry Holt and Company, LLC.

DeBear, K., & Dwight, L. (2001). *Be quiet, Marina!* Long Island City, NY: Star Bright Books, Inc.

DeLoach, K. (2004). *Daniel's world: A book about children with disabilities*. Longview, TX: Three Moons Media.

Graetz, J. E., Mastropieri, M. A., & Scruggs, T. E. (2005). Show time: Using video self-modeling to decrease inappropriate behavior. *Teaching Exceptional Children, 38*(5), 43 48.

Louie, B. (2006). Development of empathetic responses with multicultural literature. *Journal of Adolescent & Adult Literacy, 48*(7), 566-578.

Maguire, A. (2000). *Special people, special ways.* Arlington, TX: Future Horizons, Inc.

Salend, S. J., & Sylvestre, S. (2005). Understanding and addressing oppositional and defiant classroom behaviors. *Teaching Exceptional Children, 37*(6), 32-39.

Schleifer, M., Daniel, M., Peyronnet, E., & Lecomte, S. (2003). The impact of philosophical discussions on moral autonomy, judgment, empathy, and the recognition of emotion in five-year olds. *Thinking, 16*(4), 4-12.

Schoen, S. F., & Thomas, R. (2006). Altering the inappropriate comments of a student with multiple disabilities. *Journal of Instructional Psychology, 33*, 75-80.

Appendix A

Teacher Survey
pre-research analysis

What methods do you use to maintain classroom control if there are outbursts by students?

What have you noticed the students doing if there is an outburst from a student?

Have you tried to educate the students about those who may have outbursts, and explain why they have outbursts?

Student Survey
pre-research analysis

Do you ever get distracted or disturbed when a classmate screams or cries?

Do you understand why the classmate screams or cries?

How does it make you feel when someone screams or cries?

What do you think should happen to a classmate of they disturb the class?
(timeout, removed from room, etc.)

Student Survey
post-research analysis

Do you understand now why some students scream out or cry?

How do you feel about you classmates now when they disrupt class?

How do you feel about your classmates? (friend?)

Do you want to help your classmates and make them feel better?

Using Cooperative Learning in a Seventh-Grade Classroom: An Action Research Project

Shannon Clifton Burch

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-112.

Introduction to the Problem

Many educators believe that, by placing students into groups to complete assignments, they are creating a cooperative learning environment. But to create a true cooperative learning environment, the following criteria must be met: (a) two to six members must be in each group, (b) students must engage in tasks that require them to “mutually and positively depend on one another and the group’s work as a whole,” (c) all members communicate their ideas equally, and (d) all members must contribute to the work and are held accountable (Leikin & Zaslavsky, 1999, p.240). Many educators have difficulty deciding the best possible grouping method for cooperative learning. Some things to consider before putting the groups together are group dynamics, group size, and equal division of responsibility. When groups are combined without much consideration, educators are often disappointed at the amount of interaction.

Review of Literature

Elizabeth Cohen (1992) states that cooperative learning groups are said to promote a higher order of thinking (p. 4). Leikin and Zaslavsky (1999) suggest that the increase of a “student’s activeness in the experimental classroom situations occurred mainly because of the opportunity for increased student-student learning interactions” (p. 243). The idea of the student becoming the teacher allows the students to take ownership in their own and their classmates understanding of specific concepts. Students must be taught specific interpersonal skills in order for collaborative groups to work. Specific conditions must be met for groups to interact productively.

Groups should allow students to both teach and learn from others. In addition, individual learning should also take place within the group setting. For example, in the Leikin and Zaslavsky (1999) study, students were placed into groups of two with mixed-ability grouping. A high-achieving student was placed with a lower-achieving student for the group work. The students were given note cards with two problems. The high-achieving student acted as the teacher, explaining to the low-achieving student the problem-solving process. After explaining and working through the first problem, the two then solved another similar problem separately. The two discussed their answers and checked the work. Both students become experts on solving this particular type of problem. Next, the first group split, and joined with another expert to solve a different type of problem. The process started all over again. Students relied on each other to learn the new concepts.

Barbara Lemme (1998) suggests that team building efforts can be used to help reteach specific skills that students have not mastered. She incorporates team activities into almost every aspect of her classroom. For example, in her elementary classroom, she uses a clock and has each team member choose a time to represent. During the day, she will call on individual students by saying, "the people at six o'clock please pass out the folders," and so on. "An added benefit to these activities is the frequent use of a (math) skill without taking up too much class time" (Lemme, 1998, p. 251). This places some individuality within the groups, making students responsible for their own learning. It also checks to make sure individual students are learning the material.

Role assignments give students the responsibility for their own and their group's learning. Saleh, Lazonder, and De Jong's (2007) research states that role assignment is a way to increase participation within the group setting of students with average abilities. "Assigning students to specific roles is an unobtrusive way to regulate their participation in the learning discourse" (Saleh, Lazonder, & De Jong, 2007, p. 316). This study grouped one high-performing student with a low-performing student and two average-ability students. These heterogeneous groups were not changed within the study. The students were required to work together for a period of time. Rewards were given to groups and were contingent upon individual success. This required all students to be held accountable for the information. Bol, Nunnery, and Whicker (1997) indicated that this type of arrangement allows for "even the lower achieving student to contribute to the group" (p. 45). The findings of Saleh, Lazonder, and DeJong (2007) suggest role assignments can promote learning and interaction. Some examples of potential roles are reader, listener, recaller, or leader.

Pauline Georgakis (1999) suggests a few rules could help with the success of groups: (a) talk softly, so as to not disturb other groups; (b) criticize ideas, not people; (c) work as a group focusing on one problem at a time; (d) ask the members in your group first, ask the teacher a question only when your entire group agrees you need help; (e) stay on task and try to finish as many problems as possible, in your group. In her learning groups, students are not graded on solving problems correctly. If the students cannot figure out how to solve a problem, they must wait until the next day to see how the other groups solved the problem. The students must copy the correct work and give a written explanation to solve the problem. As the students get better at explaining these problems, they can eventually learn to write their own word problems. This not only creates a cooperative environment within the certain groups, but, also, within the entire classroom.

Frequency of interaction between peers does not mean that academic achievement will occur. Students must be given a task that requires interaction among the participants. Cohen (1992) states, "an interdependence in which a better student always aids a weaker student is a one-way dependence" (p. 5). The ideal situation is for students to need each other. If students are given a task that allows them to ignore the group, they may complete the task on their own with little input from the rest of the group. Also, if students are given one worksheet for the entire group to complete, one student may end up doing all of the work while the other students take it easy. “Whether or not interaction is directly related to achievement, designers of cooperative learning all have to contend with the problem of how to motivate students to interact as a group” (Cohen, 1992, p. 5). Assigning students specific roles is way to ensure group interaction. The mere assignment of a task individualizes each student’s participatory role.

Role assignment and intricate procedures have improved student communication; however, not all group members will make equal contributions (Cohen, 1992). Many influences may interfere with the group’s interactions, such as gender, popularity, race, or religion. One way of limiting the outside influences is to have the students engage in team-building exercises. Students learn how to work with one another, despite their differences. Cooperative learning can have a positive effect on social behavior, and can teach students to deal with problems in a respectful manner (Bol, Nunnery, & Whicker, 1997). Cooperative learning can prove to be very beneficial to student learning if it is implemented effectively.

Grouping individuals according to abilities seems to be the trend among many action research studies. Some research states mixed-ability grouping provides little benefit for the average student. “Their learning is inhibited because they are excluded from the teacher-learner relationships that develop between high and low achievers of the heterogeneous group” (Saleh, Lazonder, & DeJong, 2007, p. 315). It is assumed that high achieving students will “teach” the lower-ability students. If the lower-ability students are put in groups together, the students will not be able to rely on the student with the higher level of ability. The high-achieving students could master the current concepts without being held back by the lower-achieving students.

Although, the higher-achieving student that worked in a mixed ability group may benefit from the exercise of explaining the problem-solving methods to the lower-achieving student.

My action research question is this: In cooperative learning, will mixed-ability grouping in math improve summative test scores for all ability level students?

Data Collection and Results

Data Collection

Participants

The participants in this study will be my seventh-grade math classes at a rural school in Hamilton County, Tennessee. The student population of the Grades 6 through 12 school is nearly 50 percent male and 50 percent female, 96 percent Caucasian, and 76 percent enrolled in the free- and reduced-lunch program. I have three math classes that are each 90 minutes in length. Most of the 70 students (30 boys and 40 girls) are lifelong residents of Hamilton County. For the study, the classes will be called Group A, Group B, and Group C. Nearly half the students are at or above grade level in reading and mathematics; the remainder are below grade level. Six of my students qualify for exceptional education and receive pullout services for testing. Students in this study are not randomly selected.

Materials

Materials used in the study are typical materials used in my classroom. We are using the newly-introduced *Carnegie Bridge to Algebra* text as supplemental material. The *Glencoe Mathematics* text is our main text for the classroom. The students will also be using the *Carnegie Bridge to Algebra Cognitive Tutor* software twice per week in the computer lab. The room is organized like a typical middle school room. There are several posters on the walls. Two white boards and an overhead projector will be the main teaching tools used in the classroom. The desks are arranged in groups of four. Students will be assigned to their seats according to ability for the duration of this study. Special materials are not required for the study.

Procedure

In this study, cooperative learning will be conducted in a math classroom setting. The guidelines for creating a true cooperative learning environment as put forth by the Leikin and Zaslavsky (1999, p. 240) study will be as follows: (a) two to six members in each group, (b) students must engage in tasks that require them to "mutually and positively depend on one another and the group's work as a whole," (c) all members will communicate their ideas equally, and (d) all members must contribute to the work and are held accountable. The study will be conducted over a period of 6 weeks, and will cover three chapters in the *Glencoe Mathematics* text.

I will be using a post-test-only, control group design. Each group will serve as their own control group and receive both treatments. A pre-test will be given, but only to serve as data for ability placement. It will not be used to determine grouping effects. Each group will serve as their own control group and receive all treatments. The pre-test will be compared with the post-test to indicate summative test score improvement. For the first 2 weeks, Group A will have mixed-ability grouping. Mixed-ability groups will have students of all ability levels placed in the same group. The ideal group arrangement will be one high-achieving student, two middle-achieving students, and one low-achieving student. This formula may not be followed exactly due to differing numbers of abilities in each classroom. Ability arrangements can change from chapter to chapter, depending on a student's proficiency in specific mathematical content. One student may be considered low-achieving in one concept area and high-achieving in another. Ability levels will be determined by looking at pre-test scores and the sixth grade end-of-year-test scores. Group B will not participate in cooperative learning groups during this period. Group C will have same-ability grouping. Same-ability grouping will place students of similar ability levels in groups together. Just as with the mixed-ability grouping, a student can change his/her ability grouping depending on his/her scores on the pre-test and understanding of specific concepts.

At the end of the 2 weeks, the grouping will change for all classes. Group A will have similar-ability grouping. Group B will have mixed-ability grouping. Group C will not participate in regular group assignments. This grouping arrangement will last for 2 weeks. Then the grouping will change for a third time. Group A will not particpate in regular group assignments. Group B will have similar-ability grouping and Group C will have mixed-ability grouping. For the study to be effective, classes must participate in group assignments for a minimum of three times per week. The cooperative learning tasks will consist of lab assignments and solving a series of word problems, taken from the *Carnegie Bridge to Algebra* text. Students will work collaboratively with their groups to solve math problems. The students will be given a summative assessment at the end of each chapter.

Data will be collected in several ways. The students will be given a Likert scale survey (see Appendix A) to determine the initial thoughts and reactions that they have about cooperative learning groups. A pre-test will be given at the beginning of each new chapter to determine the students' prior knowledge of the unit to be studied. The summative assessments for each chapter will be recorded as quantitative data for the research.

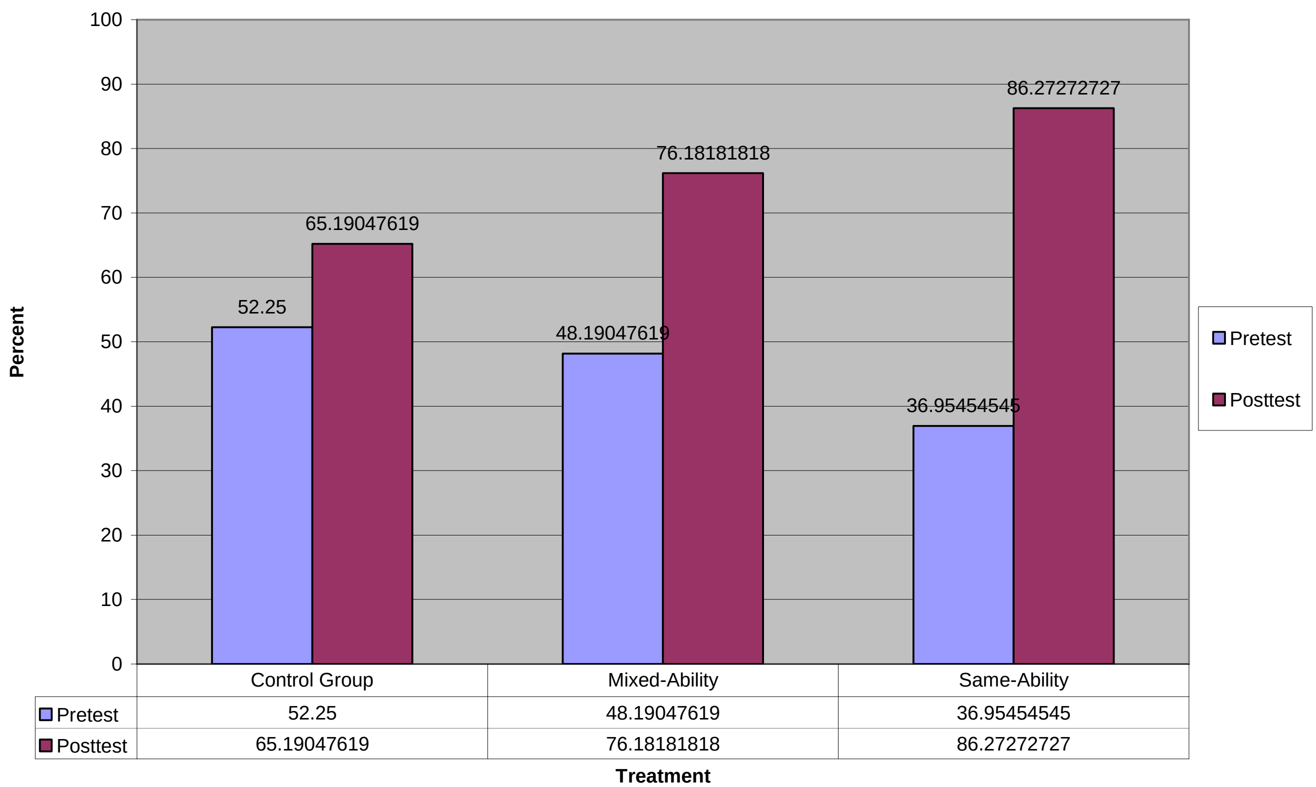
The pre- and post-tests will be analyzed. The gain of knowledge using cooperative learning groups will be compared with the gain of knowledge without using cooperative learning groups. The gain of knowledge using mixed-ability grouping will be compared with gain of knowledge using same-ability grouping. Comparing all three groups will determine which method of grouping, if any, works best with each of my classes. After reviewing related literature and classroom interactions, I believe the outcomes of my research will show that mixed-ability grouping will work best for all students. Because many classrooms are not grouped at same ability level, we must find out what works for the majority.

Results

The data was collected during the geometry unit of the *Glencoe Mathematics* text. The chapters used in this study were Chapter 10 Geometry, Chapter 11 Geometry: Two-dimensional figures, Chapter 12 Geometry: Three-dimensional figures. Prior to beginning any treatment, students were given a survey (see Appendix A). At the beginning of each chapter, students were given a pre-test. Students completed the pre-test without any assistance from outside materials or sources. This test was a 25-question, multiple-choice test. After each unit was taught with the prescribed treatment, the same 25-question test was given as a post-test.

The pre-tests for each chapter showed that there was little knowledge of the subject matter. Figures 1, 2, and 3 show the pre-test mean scores for each Group, A, B, and C. The mean scores for Chapter 10 were: Group A = 52.25, Group B = 52.65, and Group C = 62.35. The mean scores for Chapter 11 were: Group A = 48.19, Group B = 32, and Group C = 44.47. The mean scores for Chapter 12 were: Group A = 36.95, Group B = 36.36, and Group C = 48.36. The low pre-test scores indicated that the students had little prior knowledge of geometry, and would need to start from the beginning. The students would need to increase their vocabulary of the subject matter, and learn formulas to find volume, surface area, perimeter, area, and circumference. They would also need a review of the types of angles and geometric figures.

The post-test findings showed the mean scores of the students for Chapter 10 was: Group A = 65.19, Group B = 54.11, and Group C = 73.56. The mean scores for Chapter 11 were: Group A = 76.18, Group B = 58.59, and Group C = 79.57. The mean scores for Chapter 12 were: Group A = 86.27, Group B = 73.05, and Group C = 90.95. Figures 1, 2, and 3 also show mean score for the post-test.



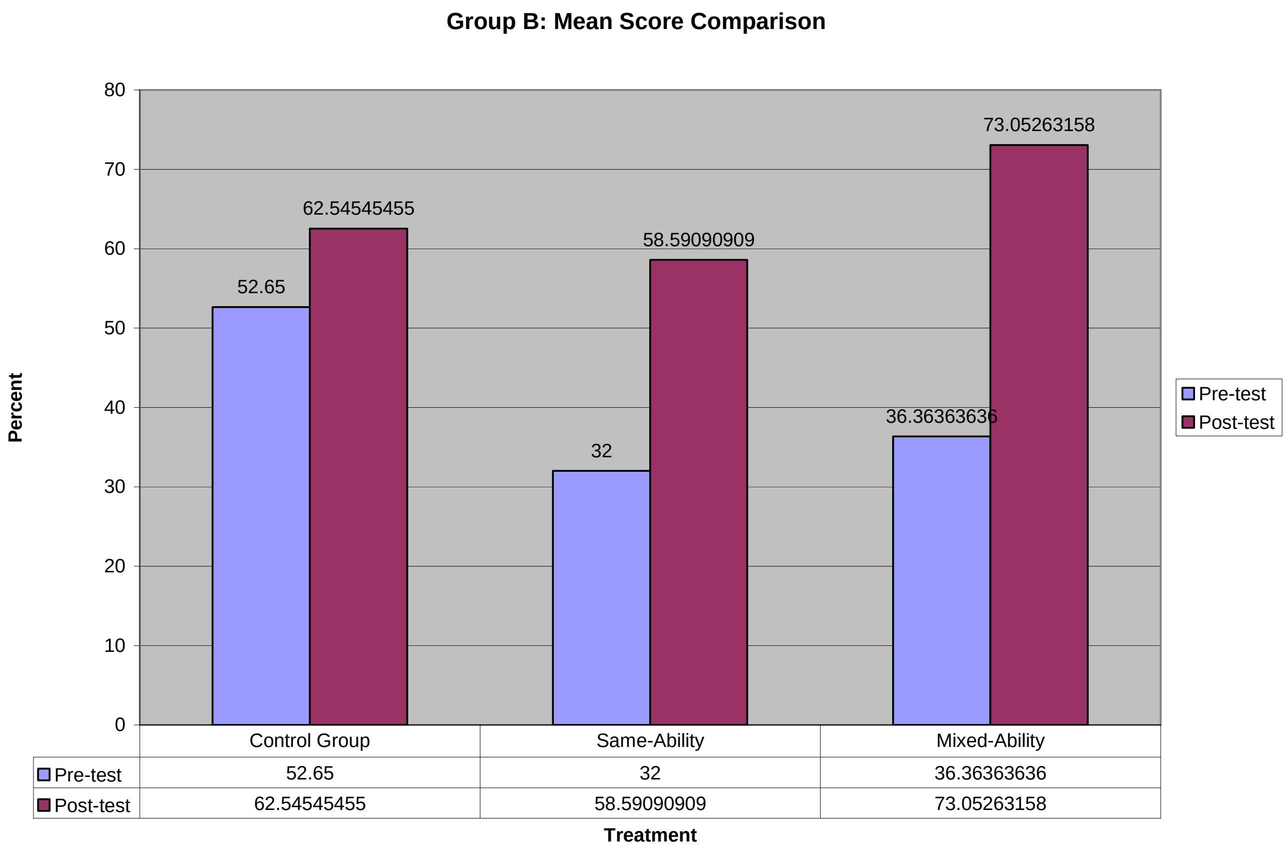
	Control Group	Mixed-Ability	Same-Ability
Pretest	52.25	48.19047619	36.95454545
Posttest	65.19047619	76.18181818	86.27272727

PRE-TEST	CHAPTER	MEAN	MEDIAN	MODE	STDEV
Control Group	10	52.25	44	44	15.6269
Mixed-Ability	11	48.19048	52	76	10.76856
Same-Ability	12	36.95455	30	96	18.99994

POST-TEST	CHAPTER	MEAN	MEDIAN	MODE	STDEV
Control Group	10	65.19048	68	72	14.40007
Mixed-Ability	11	76.18182	76	76	14.73459

Same-Ability	12	86.27273	88	96	10.29647

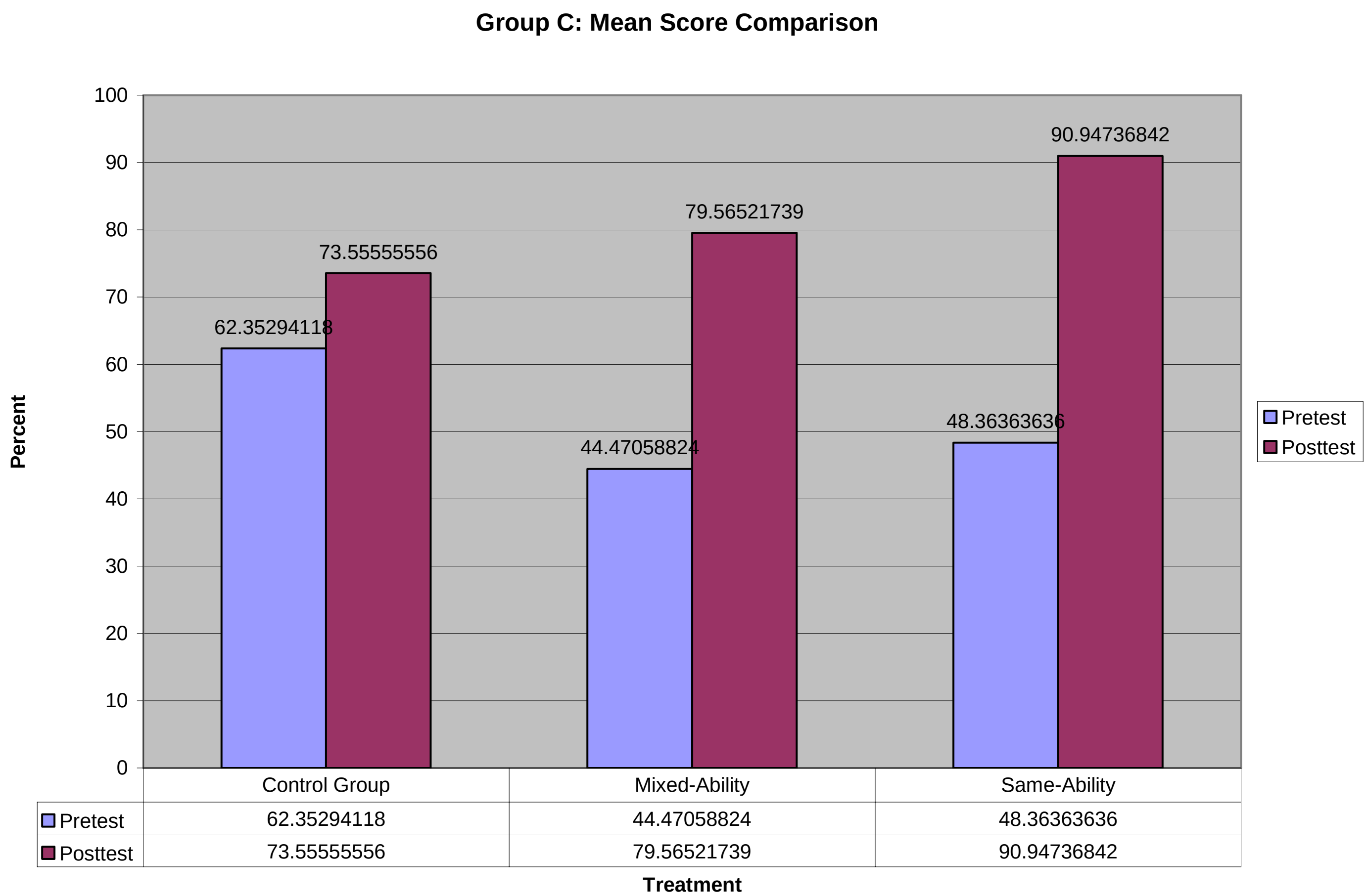
Figure1. Comparison of pre- and post test data for Group A.



PRE-TEST	CHAPTER	MEAN	MEDIAN	MODE	STDEV
Control Group	10	52.65	51.5	57	10.40382
Same-Ability	11	32	30	24	12.71551
Mixed-Ability	12	36.36364	34	32	16.27895

POST-TEST	CHAPTER	MEAN	MEDIAN	MODE	STDEV
Control Group	10	62.54545	65	66	15.06092
Same-Ability	11	58.59091	60	44	13.94772
Mixed-Ability	12	73.05263	76	76	15.42535

Figure 2. Comparison of pre- and post test data for Group B.



PRE-TEST	CHAPTER	MEAN	MEDIAN	MODE	STDEV
Control Group	10	62.35294	64	64	13.86065
Mixed-Ability	11	44.47059	44	52	10.08785
Same-Ability	12	48.36364	48	48	15.74376

POST-TEST	CHAPTER	MEAN	MEDIAN	MODE	STDEV
Control Group	10	73.55556	78	88	15.77124
Mixed-Ability	11	79.56522	88	96	19.29396
Same-Ability	12	90.94737	96	100	11.91392

Figure 3. Comparison of pre- and post-test percentages for Group C.

Conclusions and Recommendations

Conclusions

The evaluation of the mean score for the pre- and post-test for each treatment showed some improvement during both types of grouping strategies, in comparison with each control group. The data indicates that some type of group activity has a potentially positive effect on the summative test results of the students. We could interpret the data several different ways. Looking at the graph, there seems to be indication that, when the students began working in groups, their summative test scores improved. However, the test scores also improved as they moved through the chapters, which could mean that it is possible that, once they began working with geometry, it became easier for them. There could be a number of factors that could have caused the test scores to increase. Because the standard deviation is so large, the test results are non conclusive.

Recommendations

To gain insight in grouping methods and how they work, a more in-depth study would need to be performed. A longer time frame is needed to complete the study to receive valid results. According to information collected from the surveys, students enjoy working in groups. Most feel that they learn better in groups. Some students find it difficult to work in groups, and would rather work alone.

To make any grouping strategy work requires planning and persistence on the part of the instructor. Teaching students to work in groups, at a young age, will increase functionality. Cooperative learning may promise students higher-order thinking skills. Studies have shown that it teaches students that there is more than one way to solve a problem. Cooperative learning also teaches students to work together. Incorporating cooperative learning groups into the classroom seems to improve classroom climate.

As the availability of technology increases, we can use it to aid in the development of cooperative learning. There are many applications that are perfect for small groups. WebQuests are a wonderful way to increase group communication. Students must work together to navigate through an adventure that provides an opportunity for learning and fun, at the same time.

One of the main problems associated with cooperative learning is making it work in your classroom. Most teachers aren't quite sure how to implement it. Often, in professional development meetings, teachers are placed in cooperative learning groups, and they work. This is because most adults can work together within the cooperative environment. It is difficult to teach students to be tolerant of one another.

References

Bol, L., Nunnery, J., & Whicker, K. (1997). Cooperative learning in the secondary mathematics classroom. *The Journal of Educational Research, 91*, 42-48.

Cohen, E. G. (1992). Restructuring the classroom: Conditions for productive small groups. *Issues in Restructuring Schools, 2*, 4-7.

Georgakis, P. (1999). Oh, good. It's Tuesday. *Mathematics Teaching in Middle School, 5*(4), 224-226.

Leikin, R., & Zaslavsky, O. (1999). Cooperative learning in mathematics. *Mathematics Teacher*, *92*(3), 240-246.

Lemme, B. (1998). Putting mathematics into routine classroom tasks: Some ideas for teams in cooperative learning structures. *Teaching Children Mathematics, 4*, 250-253.

Saleh, M., Lazonder, A. W., & De Jong, T. (2007). Structuring collaboration in mixed-ability groups to promote verbal interaction, learning, and motivation of average-ability students. *Contemporary Educational Psychology, 32*(3), 314-331.

Appendix A: Student Survey

	Agree	Agree Some	Neither	Disagree Some	Disagree
1. I like working in groups.	1	2	3	4	5
2. I feel like an effective group member.	1	2	3	4	5
3. I know exactly what to do when working in a group.	1	2	3	4	5
4. I feel that my group members listen to what I have to say.	1	2	3	4	5
5. I am nervous about talking to group members that are not my friends.	1	2	3	4	5
6. I like math.	1	2	3	4	5
7. It is easy for me to understand what my math teacher is trying to teach me.	1	2	3	4	5
8. I understand math better when a friend explains it to me.	1	2	3	4	5
9. Math confuses me.	1	2	3	4	5
10. I feel that working in groups helps me understand math better.	1	2	3	4	5

Classroom Management through Shared Control: Helping Students Become

Problem-Solvers and Decision-Makers

Helen Lee Cook

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-100.

Introduction to the Study

One of the more challenging problems faced by educators is that of classroom management. While classroom management is largely concerned with maintaining classroom discipline, another factor that can influence effective classroom teaching is a sort of learned helplessness among students. Often teachers complain that they go home exhausted after spending the entire day telling students what to do, how to do it, and what the possible outcomes will be. In other words, the teachers are doing all of the thinking and a lot of the work for their students (Fay & Funk, 1995). In turn, these same teachers now find that they have less time to spend actually teaching their students. Fay and Funk suggests that these educators can actually “gain control by giving some away” (p. 143), meaning that, when students become responsible for their own problem-solving and decision-making, the classroom teacher’s time and energy can now be focused on the practice of teaching, or classroom instruction. Fay describes his own personal use of classroom management techniques and philosophy as the “Love and Logic Approach to Discipline” (preface, vii), and posits that there are four key principles of the Love and Logic approach. We will look more closely at each of these principles and discuss them briefly.

The Enhancement of Self-Concept

It is no new phenomena that many young children, today, suffer low self-esteem or have low self-concept. It is also not unknown that, by helping children develop self-esteem, thereby improving their self-concept, they can become more secure in their own decisions. One particular study (Kistner, Ziegert, Castro, & Robertson, 2001) in the area of negative self-worth indicates that children who have a sense of helplessness tend to, “equate doing well with evidence of positive worth and doing poorly as an indication of negative worth. A sense of contingent worth, in turn, is associated with goals children pursue and with their interpretation of successes and failures" (p. 338).

They suggest that the children who characterize themselves in this manner tend to choose non-challenging situations, with little chance of failure, in order to prove their self-worth, rarely reaching their full potential. Further, they indicate that these children are prone to depression, which only serves to enhance their sense of helplessness. Their study of 400 middle-class, kindergarten children suggests that children with "validation-seeking goals" often engage in behaviors that both alienate them socially and undermine their academic success. Teachers can help develop self-esteem by being empathetic towards children; listening to them; providing them with opportunities to succeed, thereby proving to worth to others; acknowledging each child as an individual; and involving them in the decision-making process (Salend & Sylvestre, 2005). "Strong self-esteem permits children to take risks" (Glazer, 2002, p. 96) and children must feel comfortable and confident in risk taking before they are capable of taking responsibility of their lives, either inside of or outside the classroom (Glazer, 2002). Improved self-concept then leads us onto the second key principle, shared control (Fay & Funk, 1995).

Shared Control

As mentioned previously, Fay and Funk suggest that educators can "gain control by giving some away" (p. 143). Once students have become more confident in their abilities, they are more capable of sharing in the decision-making process inside the classroom. One group of students with which the principle of shared control is most beneficial is the group that may be regarded as defiant or oppositional. These students often present challenges in both instruction and discipline. Fay (1995) states, "we can either give control on our terms, or the kids will take it on theirs" (p. 139). One of the easiest ways to reduce power struggle between teacher and student is by allowing students to make some of their own choices. Salend and Sylvestre suggest that many children can further enhance their self-esteem when making their own choices (p. 35). Fay and Funk (1995), however, caution that choices must be offered within limits. This is especially important when working with young children and/or those who are still in the process of building self-esteem and confidence. “Limits are important because they determine the boundary of our security” (p. 142). Some examples of choices to be offered in the classroom might include:

Do you want to

- put your desks in rows or pods?
- begin with math or language?
- do the odd or even problems?

Choices pertaining to discipline might include:

Do you want to

- finish your work during free-play or turn it in late for a lower grade?
- call your own parent or have the teacher call?
- have time-out at recess or free-play?

Allowing students shared control also helps communicate that they are responsible for their actions, thus prompting them to be more likely to follow through with the decisions they make (Salend & Sylvestre, 2005). Of course, it is vital that both teacher and student understand and realize that there are times when shared control is not always an option. Teachers and students must learn which decisions are “mine,” which are “ours,” and which are “theirs” (Rooney, 2004). Now that students are beginning to share control and make their own decisions, they will begin, also, to experience the consequences of some of their decisions. This brings us to the third key principle, consequences with empathy (Fay & Funk, 1995).

Consequences with Empathy

Consequence is defined as a result, effect, outcome, or aftermath (Merriam-Webster, Inc., 2005). The Love and Logic approach recognizes that humans must often suffer hurt or pain in order to make a change. There are two types of pain, each with association to either consequence or punishment. The difference between the two, Fay and Funk (1995) state, “is where we interpret the pain emanating from. Consequences result in pain coming from the inside and punishment results in pain coming from the outside” (p. 164). In order to further determine whether or not pain emanates from within or from outside, one must first determine that a problem exists (unwanted action or behavior).

Next, and this is critical, one must determine who owns the problem. When a student recognizes that he or she owns the problem, he or she can begin to recognize who must correct the problem (whose behavior must change). The third step, also crucial, is to show empathy. When he who does not own the problem (the teacher) shows genuine empathy, it makes it nearly impossible for the owner to transfer the blame, thus causing the owner to either suffer the pain or make the decision to change behavior (Fay & Funk, 1995).

Empathy is also very important in building trust-relationships. When a student recognizes that we, the teachers, genuinely care about them, that we like them as people, their personhood becomes validated, although the behavior is not condoned (Mendes, 2003). The key purpose of consequences with empathy is to prompt the offender to make a decision to change. Wesley (2004) cites Nichols, a psychology professor, as writing:

> The idea is not to distance ourselves from others but to let them be themselves while we continue to be ourselves. Learning this kind of empathetic listening involves a paradox of

control in which the listener controls him or herself and lets go of the urge to control the other. (p. 40)

Lastly, offer a positive relationship message. Showing genuine respect and regard help further demonstrate that the only way to alleviate the pain is to make a conscious decision to change behavior. Understanding consequences with empathy leads us to the fourth key principle, shared thinking (Fay & Funk, 1995).

Shared Thinking

Now that the groundwork has been laid through the first three key principles, enhancement of self-concept, shared control, and consequences with empathy, the fourth, and final, key principle, shared thinking, can begin to take place. Noted educational psychologists, Bloom, Engelhart, Furst, Hill, and Krathwohl, state “that unless the individual can do his own problem-solving he cannot maintain his integrity as an individual personality” (cited in Boone, Boone, & Gartin, 2005). The ability to problem solve, in turn, further enhances the individual’s sense of self and confidence in his or her abilities, which, in turn, leads to a greater sense of control, culminating in continued questioning, thinking, problem-solving, and decision-making. Funk suggests that the two types of questioning most often used in the classroom are “knowledge questions” and “synthesis questions” (Fay & Funk, 1995). In accordance with Bloom’s Taxonomy, knowledge questions consist of recalling known or learned facts only, while synthesis questions require the student to form a new whole put together from parts previously unrelated to each other (Boone, Boone, & Gartin, 2005). Clearly, this type of synthesis questioning requires a great deal more thought and effort from the student.

Hargrove’s article (2005), *What makes a “good” teacher “great?,”* cites a study by the Seale Center for Teaching Excellence at Northwestern University, and reports that “great”

teachers generally followed the key principles of the Love and Logic approach, which fostered critical thinking. “Great teachers,” she said, “will challenge them while simultaneously offering support and making it ‘okay’ to try and fail and try again
(Hargrove, 2005, p. 30). Another approach that closely resembles the Love and Logic approach of shared thinking is the “Beam, Focus, Bind” technique. First, the teacher directs a question to the entire class, “beaming,” followed by “focusing” on an individual student for response, and, finally, “building” from student to student as each is allowed to share ideas. Building allows for open-ended, higher-level thinking. A new question is then posed, and the process begins again (Wigle, 1999).

While each of these approaches encourage shared thinking, that is, critical questioning and thinking on the part of the student, teaching students *how* to question also becomes an issue. Students will need, at some point, to learn the difference between closed or knowledge questions, and open or synthesis questions, and will need to learn the appropriate uses for each when dealing with tests and curriculum. One interesting and simple suggestion for teaching young children these differences involves the use of red- and green-colored index cards. Closed questions are placed on the red cards, indicating to young children that these questions require one answer, and the questioning is stopped, like a red light. Open questions are similarly placed on the green cards, indicating that these questions may have more than one answer, or may lead to further questioning, like a green light to continue (Scholl, 2005).

Obviously, this idea of shared thinking can be put into practice in the classroom, concerning both discipline and curriculum. Ideally, it would be used extensively in both areas. As disruptive and unmotivated students are, generally, the greatest cause of frustration for educators today, the ability to involve such students in shared thinking related to their studies and learning can divert such behaviors by redirecting the focus of their energy and attention from gaining control to the learning process.

Criticisms of Self- Directed Learning

Although there are numerous methods and approaches of self-directed learning available, and much research and experience has supported the effectiveness of them, there is some argument that very young children may not be capable of such problem solving and decision-making. Merriam (2004) cites both Mezirow (2000) and Piaget, indicating that transformational learning is wholly dependent upon a certain level of cognitive development and dialectical thinking simply unavailable to the very young. She further claims that Piaget's model reveals that many adults never attain this level of higher-order thinking or reasoning:

> Mezirow (2000) himself commented that not everyone can participate in rational discourse. There are "preconditions" of maturity, education, safety, health, economic security, and emotional intelligence. Hungry, homeless, desperate, threatened, sick, or frightened are less likely to be able to participate effectively in discourse. (Merriam, 2004, p. 65)

Merriam does conclude, however, that, although some measure may be used to determine transformational learning based upon Mezirow's theory, the validity and reliability of the measures would be open to question (Merriam, 2004).

Summary

Classroom management is an integral part of successful teaching, and one of my greatest concerns in becoming an educator. My experience, albeit limited, leads me recognize that many young children, today, lack the necessary skills to be their own problem solvers or to be responsible decision-makers. As implied in so much of the research material I studied, many children simply lack the ability to think for themselves, leading to frustration on the child's part, and learning and/or behavior challenges for the educator. I believe that all children are capable of becoming independent, responsible, problem-solving individuals, able to reach their full potential as students and citizens. I also feel that the earlier these techniques are employed, that less intervention will be necessary at a later, and more formidable, date. Much, if not most, of the literature that I have examined pertains to the study of middle- to high-school-aged students. I am particularly interested in employing these techniques during the elementary school years, namely the primary years. Given that most educators, today, recognize the merits of the spiraling system of learning and education, can the four key principles of Love and Logic, when applied in the primary years, lead young children to more independence? Can young children, through the use of the first three key principles of Love and Logic, become capable shared thinkers? Are young children able to develop some of their own questions and learning, in conjunction with the classroom curriculum? Will the introduction of self-created curriculum result in greater student interest in shared thinking? Will behavior issues lessen with increased interest in shared thinking and self-directed learning?

Data Collection and Results

Participants

The participants in this study were derived from three, fourth-grade, social studies classes in an urban magnet school located within Hamilton County. The population of the school consists of approximately 400 students; approximately half are females and approximately half are male. The student body is very diverse, both racially and economically, with 166 African-American students, 189 Caucasian students, 20 Asian students, and 8 Hispanic students, 36 percent of which are economically disadvantaged. The 2007 attendance rate in the school was approximately 97 percent, and the promotion rate nearly 99 percent, both above the state goal. Of the 68, fourth-grade students, 9 students currently receive special services under Individualized Education Plans; 3 students are learning disabled, 2 students are language impaired, 2 students have been diagnosed with ADD and memory issues, 1 student has been diagnosed with ADHD and also has a 504 plan, and 1 student is autistic. Modifications are also made within the classroom for a student who has severely diminished sight. Four other students are currently performing below grade level, but are not served under an Individualized Education Plan. The results of this study include data from 30 students in three classrooms, as other students failed to turn in parental consent forms.

Materials

Materials used for this study were typical materials found within the school. We utilized approved primary sources, instructional materials, textbooks and magazines, a computer and portable light-box located within the classroom, and student-created social studies folders. The only special materials used in this study were objects and items found outside of the school building, located on school grounds.

Instruments

- Pre-test – see Appendix A.
- Pre-Research Analysis Student Learning Survey – see Appendix B.
- Post-test – see Appendix C.
- Post-Research Analysis Student Learning Survey – see Appendix D.

Procedure

This study took place during my second student teaching placement. I set out to measure whether or not student interest, behavior, and learning would be positively influenced when the students were given the opportunity to choose the particular types of lessons and activities to be incorporated into a required Lewis and Clark unit plan. Prior to the design of the unit plan, I administered a pre-test to determine the extent of the students' prior knowledge of the subject. The pre-test consisted of 10 questions, 5 true/false questions and 5 multiple choice questions. Upon completion of the pre-tests, students were given a student learning survey to complete, based upon the different learning styles. Students were asked to indicate which activities and practices they enjoyed most, and found to be most helpful or beneficial in their learning. I tallied the results of the student learning surveys and incorporated the most popular choices into a 3-week, Lewis and Clark unit plan. Although the results of the survey were varied, by and large most students indicated that they preferred hands-on, interactive, group-related activities.

I then designed the unit to incorporate the kinds of activities indicated as most beneficial, using a lot of visual materials, creative illustration/construction activities, outdoor experiences, cooperative group activities, activities using movement and performance, food experiences, and games. The students created and maintained a tri-fold project (social studies folder with notes) throughout the unit instruction, adding information and materials as we worked through each lesson. In order to obtain a clear measure of benefit, I also included an activity in the final lesson using a teaching strategy that nearly all students had indicated that did not enjoy. During the implementation of this unit, I kept personal notes regarding student participation and behavior.

The post-test was administered on the last day I taught the unit. The post-test incorporated the same 10 questions as on the pre-test, with the 5 true/false questions remaining unaltered. Ten additional questions were added, and the 5 multiple choice questions were reformatted, all into fill-in-the-blank, matching, or short answer questions, resulting in a total of 20 questions on the post-test. Two additional questions were included for extra-credit points, up to six additional points; failure to answer or incorrect answers were not penalized. The students were required to complete their tri-fold projects by the time of post-test. The tri-fold projects were to be used for study purposes, as well as for an open-note component of the post-test, as directed by the cooperating teacher. All tri-fold projects were to be turned in, along with the completed post-test. Upon completion of the post-test, students were given a student post-research analysis survey to complete. This four-question survey was used to determine which activities the students enjoyed the most and least, and whether or not they felt that student choice impacted their learning in any way.

Results

Students scored anywhere from 20 to 90 on the pre-test, with the average score at pre-test being 52 percent. Post-test scores ranged from 56 to 106, with an average post-test score of 87 percent. The largest gain was from a pre-test score of 20 to a post-test score of 93, and the smallest gain was from pre-test scores of 70 and 80 to post-test scores of 73 and 83, respectively. Of the 30 students participating in this research, 3 were noted to have a history of behavioral issues. During the implementation of this unit plan and activities, only one of these students, and only this student, demonstrated any negative behavior. Not surprisingly, this behavior was observed during the activity designed specifically because it appealed the least to the students' interests and learning styles. The topic of this particular activity was also included in a Jeopardy game unit review prior to post-testing, but not included on the post-test itself. I noted, during the game review, that these questions were either unanswered or answered incorrectly the most number of times.

The post-research analysis surveys indicated that all students felt that being included in the decision-making process, as it pertained to their interests and learning styles, was beneficial to their overall learning, and increased their enjoyment of this unit of study. While the responses were varied, all students indicated that they most enjoyed the activities initially identified as "most popular" and least enjoyed the activity identified as "least popular." On a somewhat humorous note, several also indicated that the post-test, itself, was their least favorite activity. Interestingly, three of the students who are served under an IEP stated that they felt that their learning was made easier because the activities were designed specifically toward their learning styles. (See Figure 1.)

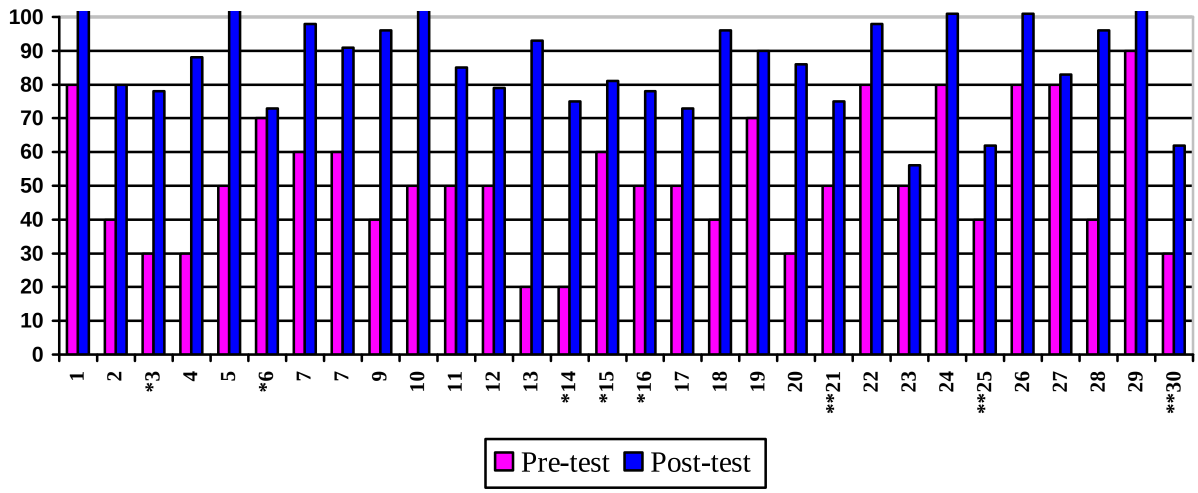


Figure 1. Pre- and post-test scores for Lewis and Clark social studies unit for Grade 4. *Students under I.E.P. **Students performing below grade-level, no IEP.

Discussion

Overall, I was quite pleased with both the post-test scores and the results of the student survey. With a post-test score average of 87 percent, I feel confident that sound learning has, in fact, taken place. Initially, I was concerned that this particular unit would be extremely difficult to cover in the customary 2-week student teaching time allotment, and, although my cooperating teacher agreed to let me extend the unit into a full 3 weeks, I still felt as though we were moving through the material at break-neck speed. Ideally, I would have implemented this unit over a 4-

to 6-week period. At the time of post-test, many students had, unfortunately, chosen not to complete their tri-fold projects by deadline, meaning, of course, that they did not have adequate notes and information on-hand for both study and the open-note post-test. Not surprisingly, the students who achieved the highest post-test scores were those who had completed the tri-fold projects on time and satisfactorily, while those who achieved the lowest scores had not. All students, however, did show a gain from pre-test to post-test.

As is required by the fourth-grade teaching team, the students who had not completed their tri-fold projects were given infraction sheets to complete, and were required, by the terms of the infraction process, to give up their recess time until the assignment had been satisfactorily executed. Also, a component of the infraction process is the letter that students must write to their parents explaining the infraction and their understanding of its impact. Once the students had successfully completed their tri-fold projects, I had them re-examine their post-tests, along with their tri-folds, in order to determine how their grades may have been affected by their poor choices. All students stated that they believed they would have made a perfect score on the post-test, had they chosen to complete their projects by the deadline.

On a happier note, it is my preference, in accordance with my own learning style, to incorporate many hands-on, manipulative, and cooperative activities into any unit of study. I was pleased that so many of the students indicated that this was their preference, as well. The most frequently selected activity on the student learning survey pertained to learning outdoors. Because this was a Lewis and Clark unit, I incorporated a journaling activity, mimicking the journaling done during the actual expedition. The classes met in the outdoor classroom, adjacent to the school, and the students were to select “specimens” or make observations of plant life, animal life, land formations, people, and/or experiences, and document them in their journals.

Many of the students actually selected “specimens” of plant life to place in their journals, and then wrote detailed descriptions of their locations, attributes, growing conditions, etc., often filling several pages within their journals. I observed no behavioral issues during this activity. Several days later, the students began asking when we could do something like that again, clearly having enjoyed the activity. My happiest moment came with the conclusion of this unit of study, also my last week in this placement prior to TCAP testing, when the students asked the cooperating teacher to continue teaching the unit after my departure. Obviously, they had enjoyed the unit as much as I had!

Conclusions and Recommendations

Conclusions

I am most interested in the fact that the students, themselves, felt that having a choice in the design of the curriculum was beneficial to their learning. I have been fascinated with the Love and Logic approach to discipline for many years, but, prior to the implementation of this study, I have not given as much thought to this idea as it relates to curricular learning. I was amazed to find that the key components of the Love and Logic approach, the enhancement of self-concept, shared control, consequences with empathy, and shared thinking, were actually verbalized in some manner in all of the student responses on the final surveys! I noted earlier that it was interesting that three of the IEP students felt that their learning was made easier because they were given a choice about how they wanted to learn a particular subject. I am left to speculate that their knowledge of the incorporation of these particular activities into the unit made them feel more confident, thus, more able.

The student surveys also seemed to indicate that the knowledge of shared control increased their interest in the subject matter immensely. While I never felt that I was not in total and complete control of the unit, lessons, activities, and instruction, the realization that the students actually felt as if *they* were in control furthers my belief in the Love and Logic approach to discipline and “ownership.” This was readily apparent in the fact that minimal negative behaviors were observed during the course of this study, other than the failure to complete the tri-fold projects prior to post-testing.

Also noted earlier was the student reaction to consequences with empathy. When the students were required to relinquish their recess in order to complete their tri-fold projects, they, themselves, stated that they realized that had they chosen to complete their assignments as given, they would have scored much higher on the post-test. I feel that this is a clear demonstration of their understanding of ownership, responsibility, and, unfortunately, in this case, consequence.

Lastly, I believe that these students began to display evidence of shared thinking, in that their focus was absolutely shifted from gaining control of the classroom, to, instead, the learning process. All in all, this resulted in a positive experience for everyone involved, clearly enabling both the students and the educator to experience success.

Recommendations

Given the vast amount of professional literature devoted to the current crisis of self-discipline and problem-solving skills lacking among students, today, educators are becoming increasingly more aware of the need for practical, logical, and effective classroom management strategies that address not only behavior, but overall learning, as well. The National Association for the Education of Young Children offers several initiatives designed to promote children’s healthy social and emotional development. Through support from the Doris Duke Charitable Foundation, along with additional funding and support from the Center on the Social and Emotional Foundations for Early Learning (CSEFEL) and the Technical Assistance Center for

Social Emotional Intervention (TACSEI), the NAEYC offers leadership development, partnerships with other national organizations doing the same work, and research to help guide these efforts.

In addition, numerous professional education organizations offer workshops, as well as professional development training, classes, and seminars teaching the Love and Logic approach; some schools offer college credit upon completion of the 2-day presentation of the Love and Logic Classroom. Some of these workshops are offered in conjunction with professional inservice training, while others are offered in a more in-depth manner during annual conferences held each year in both Colorado Springs and Kansas City. Various other 1-day seminars may be attended throughout the year in several locations across the country. Further, the Love and Logic organization offers selected opportunities to become instructors of the Love and Logic approach to parenting. It is most feasible to attend one of the annual conferences, although some school systems regularly employ the services of the Love and Logic team for inservice purposes.

Technology may be incorporated into the curriculum in a variety of ways, either for use in both instruction and activities, or as a means to further disseminate Love and Logic information. The Love and Logic Press offers audiocassettes, as well as videotapes and DVDs, any of which might be used for professional inservice training.

In some instances, grant money has been made available, and used for the purpose of employing professional inservice workshops teaching the Love and Logic approach. I have been unable to locate any such grants within the state of Tennessee, and none through the Tennessee Education Association. Although, the TEA Web site does include nearly a dozen links to outside grant resources, though none appear to be viable sources for securing this particular type of grant. Many local charitable organizations have grant applications available, and, perhaps, this could be an avenue of investigation for any school district interested in such a grant.

References

Boone, D., Boone, H., & Gartin, S. (2005). Are you challenging your students: Feeding them knowledge or challenging them to think? *The Agricultural Education Magazine, 77*(4), 25-28.

Fay, J., & Funk, D. (1995). *Teaching with love and logic: Taking control of the classroom.* Golden, CO: The Love and Logic Press, Inc.

Glazer, S. (2002, November/December). The independent learner. *Teaching K-8,* 96-98.

Hargrove, K. (2005). What makes a “good” teacher “great?” *Gifted Child Today, 28*(1), 30-32.

Kistner, J., Ziegert, D., Castro, R., & Robertson, B. (2001). Helplessness in early childhood: predictions of symptoms associated with depression and negative self-worth. *Merrill-Palmer Quarterly, 47*(3), 336-354.

Mendes, E. (2003). What empathy can do? *Educational Leadership, 61*(1), 56-59.

Merriam, S. (2004). The role of cognitive development in Mezirow’s transformational learning theory. *Adult Education Quarterly, 55*(1), 60-68.

Merriam-Webster, Inc. (2005). *Webster’s new dictionary of the English language.* New York, NY: Merriam-Webster, Inc.

Rooney, J. (2004). Sharing the decisions. *Educational Leadership, 62*(3), 84-85.

Salend, S., & Sylvestre, S. (2005). Understanding and addressing oppositional and defiant behaviors. *Teaching Exceptional Children, 37*(6), 32-39.

Scholl, R. (2005). Student questions: Developing critical and creative thinkers. *Thinking, 17*(4), 34-46.

Wesley, D. (2004). Just listen. *Principle Leadership, 5*(3), 39-41.

Wigle, S. (1999). Higher quality questioning. *The Education Digest, 65*(4), 62-63.

Appendix A

4th Grade Social Studies
Pre-test

Answer *True* or *False.*

1. _____The United States government knew the exact size of the Louisiana Territory before it was purchased.

2. _____ Lewis and Clark traveled by themselves as they explored Louisiana.

3. _____ The purchase of the Louisiana Territory more than doubled the size of the United States.

4. _____ This journey discouraged others from exploring America's western lands.

5. _____ No person had ever seen the Louisiana Territory before the Lewis and Clark expedition.

Multiple Choice- Circle the Correct Answer.

6. What formed the eastern border of the Louisiana Territory?
   a. Appalachian Mountains
   b. East Coast
   c. Mississippi River
   d. Louisiana

7. Which country first owned the Louisiana Territory?
   a. Great Britain
   b. Spain
   c. Mexico
   d. France

8. What is an expedition?
   a. an ocean journey
   b. a new colony

   c. a family car
   d. a journey or exploration

9. Which president added the most land to the United States?
   a. Andrew Jackson
   b. Thomas Jefferson
   c. James Polk
   d. Abraham Lincoln

10. Who led the expedition to explore the Louisiana Territory?
   a. Sam Houston
   b. Daniel Boone
   c. Meriwether Lewis
   d. David Crockett

Appendix B

Student Survey
Pre-Research Analysis

How I Learn:

Place a check mark beside any statement that applies to YOU. ☺

I learn a new concept best when…

____ the teacher uses the overhead projector to explain it.

____ pictures are used to explain it.

____ the teacher writes notes on the board for us to copy.

____ the teacher explains it to us with examples.

____ we learn it with a song.

____ we work in groups to figure it out.

____ I look at the directions and figure it out myself.

____ I'm moving or acting it out while I learn.

____ I know why it is important for my life.

____ I'm learning outside the classroom.

____ the teacher asks questions to get us thinking and we figure it out like a puzzle.

I understand best when…

____ the teacher helps me one-on-one.

____ the teacher helps me in a small group.

____ my classmates explain it to me.

____ the teacher tells the whole group.

If we learned something a while ago, one way I remind myself about it is…

____ look at posters in the room about the topic (if there are any).

____ look at pictures I drew when we learned it or pictures the teacher used to explain it.

____ read over my notes.

____ ask the teacher to explain it again.

____ sing a song we learned about it (if there was one).

____ tap out rhythms while I review.

____ practice with friends or family members.

____ quiz myself or go over it in my head.

____ move around while I review.

____ study while eating a snack or chewing something.

____connect the concept to things that are important to me.

____ review outside the classroom.

____ come up with a plan or a system for studying (a list, chart, or another plan).

Appendix C

4^{th} Grade Social Studies- Lewis and Clark
Post-test

True or False:

1. _____ Lewis and Clark traveled by themselves as they explored the Louisiana Territory.
2. _____ No person had ever seen the Louisiana Territory before the Lewis and Clark expedition.
3. _____ The United States government knew the exact size of the Louisiana Territory before it was purchase.
4. _____ The purchase of the Louisiana Territory more than doubled the size of the United States.
5. _____ This journey discouraged others from exploring America's western lands.

Fill in the Blanks.

6. President _____________________ ordered __________________ to survey the Louisiana Territory.

7. The United States Government purchased the Louisiana Territory from ______________________________________.

8. The Louisiana Territory stretched from the Mississippi River to the ____.

9. The United States paid ___________________ in order to acquire the Louisiana Territory.

10. The official name of the Lewis and Clark expedition was ____.

Matching:

11. _____ artifact — a. large, shallow boat used to haul freight
12. _____ species — b. journey or exploration
13. _____ keelboat — c. a tool used to aid navigation
14. _____ expedition — d. any object made or used by humans
15. _____ sextant — e. category of plants or animals sharing common characteristics, designated by a common name

Short Answers:

16. Why did President Jefferson send an expedition to explore the Louisiana Territory?

17. Why was Sacagawea so important to the Corps of Discovery's expedition?

18. Why did the explorers bring gifts for ant Native American groups they might meet along the way?

19. How did the Lewis and Clark Expedition help bring settlers to the West?

20. When did the Lewis and Clark Expedition begin? When did it end?

Extra Credit:

Name two ways the expedition communicated with Native Americans.

How did the Lewis and Clark Expedition affect the Native American peoples?

Appendix D

Student Survey

Post-Research Analysis

Lessons I Enjoyed the Most:

Please answer the following questions. Provide as much detail as you can. You may use the back of this paper if you need more room☺

1) Did you have fun during this unit of study? Why or why not?

2) What did you enjoy the most? What did you enjoy the least?

3) Do you feel it was helpful to be able to make some of your own choices about your learning and the teaching practices during this unit? Did it improve your interest and learning in any way? How?

4) Do you feel that it would be helpful to you to always have some choices in your learning and the teaching practices? Why or why not?

Manipulatives: Building Blocks for Mathematics

Adam Crowley

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-094.

Introduction to the Problem

While working at Sylvan Learning Center, I became accustomed to using manipulatives as part of the education process. Sylvan has a strong record of success in helping students achieve improved levels of competency. Sylvan believes strongly in the use of manipulatives, and their record of success lends credibility to the use of manipulatives in teaching. After experiencing, first-hand, the impact that the use of manipulatives has on students, I became curious about the value manipulatives may have in the education process. Do they significantly improve mathematical skills and competency? If teachers find, through the use of manipulatives, another great tool that helps students gain more knowledge, can they be more successful as teachers? Can manipulatives play a vital role in education? Further research is needed to measure more effectively the impact manipulatives may have on teaching math.

Description of Problem

To help determine the teaching value of manipulatives, I devised a simple research project to determine whether manipulatives increase students' knowledge in a specific math skill, from basic algebra to advanced mathematics. My initial hypothesis is that manipulatives are a beneficial and valuable tool for teachers to use as part of their teaching strategies, and that the use of manipulatives contributes to improved math understanding, as evidenced by higher test scores.

To test the hypothesis, I gave a pre-test to students which helped establish a baseline for their level of knowledge in advanced mathematics. With a baseline established, I divided the class in half, randomly placing a cross-section of both high-scoring and low-scoring students into each group. The mathematical skills of each group were as identical, as possible.

One group of students was taught advanced mathematics in the traditional method, including lecture, demonstration, individual class work practice, and homework. The second group was taught the same material in the same method, but with the additional use of real-world situations that were adapted with manipulatives.

Students were to be given another test to assess their level of advanced math comprehension following a period of study of 2 weeks. The post-test results were compared to the original test scores to determine whether the students who received instruction that included real-world manipulatives had better advanced math skills than those students who did not use manipulatives. To add validity to the results, several classes of students would be evaluated using these same criteria (using the same test.)

All dedicated teachers have as a goal to do whatever they can to share knowledge with students, and prepare them for being productive members of, and contributors to, our society. If the use of teaching manipulatives proves to be effective, their use will make teachers even more effective, and society is the beneficiary.

Research Questions

- Does the use of manipulatives create a learning advantage for students that use them, as opposed to those taught with traditional methods?
- Will the use of manipulatives increase student involvement in the learning process and show improved understanding of advanced mathematical concepts?
- Will the use of manipulatives weaken students’ cognitive ability to solve mathematically-advanced math problems without manipulatives?

Review of Literature

A frequent occurrence in today's society, when students tell parents or friends they are enrolled a math class, is a chorus of sighs or moans, or perhaps expressions of sympathy. What elicits these reactions? For reasons that may not always be founded in reality, society, through these reactions, may have the unintended impact of making our future leaders afraid of mathematics.

Those who react negatively toward math, and express this negativity to our future leaders, may suffer from math anxiety. Unfortunately, the perceptions of math that they share with students may actually place the students' success in mathematics at risk. Math anxiety is best explained by Bellonio (2001, p. 2):

> Many students (and adults) have math anxiety. These students are constantly frustrated by poor grades, poor math related experiences and lack of understanding of mathematics. These students do not enjoy mathematics and do not see the need for its usefulness or its applicability in their lives. This feeling of math anxiety often leads students to pursue careers that limit the use of mathematics. As our society advances so does the ever-present need for mathematics skills. Mathematics is an element present in virtually every career (especially if you are looking to make money).

Teachers should strive to change society's negative attitude toward mathematics by helping students learn math in a fun way. If teachers can capture students' attention by allowing them to have a little fun while learning math, they may be able to create a new atmosphere that reduces or eliminates math anxiety.

With the development of effective teaching tools, teachers today have much more at their fingertips to help students succeed in mathematics. Research shows that an excellent method of helping students learn math is through the use of various manipulatives, with the most recent manipulatives available to teachers being internet-based, or virtual, manipulatives. Sowell (cited in Ernest, 1994, p. 2) “concluded that mathematics achievement is increased by the long term use of manipulatives and that student attitudes toward mathematics are improved when they are instructed with manipulatives.” Because of the benefits manipulatives may have on math teaching, teachers need to be trained to use them effectively. If emerging teachers are taught to use manipulatives during their training, their abilities to overcome math anxiety among students will be greatly increased, thereby increasing the teachers’ effectiveness and improving the students’ mathematical skills.

The use of the Internet has opened many doors for teachers, and improves their effectiveness, especially through the availability of online manipulatives. Barta states, “I urge teachers who do use virtual manipulatives with young children to supplement, or balance, those activities with frequent opportunities for students to interact with real objects as well” (2002, p. 132). Virtual manipulatives can influence students of all ages, from elementary students to adults. “Children in the primary grades need the concrete exposure that manipulatives provide, and older children can benefit from the use of manipulatives as well” (Hodge, 2003, p. 461). In addition to manipulatives, the Internet also provides effective and rapid communication among teachers. If one teacher has a great idea that works with students, he or she may share that success with other teachers so more students can have access to the manipulative.

Most of the research about the use of manipulatives centers on elementary-aged children. A widespread perception is that, to teach young children math, the teacher needs to use “hands-on" activities. This perception is valid, but why should teachers not use manipulatives for middle and high school students, as well? Older students, especially those reared in a visually-oriented society such as ours, will also greatly benefit from the visual representation of mathematical concepts. Research indicates that special needs students benefit from the use of math manipulatives (Wisniewski & Smith, 2002, p. 8). Wisniewski and Smith determined that third and fourth grade students with a mild mental disability, a learning disability, or other health impairment improved their math skills through the use of manipulatives. Other research promotes the use of touch math (hands-on), and the manipulatives made an impact on these student's abilities in a positive way (Moyer & Jones, 2004):

> By demonstrating how to use the manipulatives as tools for better understanding, teachers open doors for many students who struggle with abstract symbols. Often this struggle can be minimized or avoided entirely by simply using different representations before using abstract symbols alone, thus giving students a firm conceptual base on which to build higher mathematical thinking. Communicating the value of representations and the importance of being able to move flexibly among different representational systems, including manipulatives, visual images, and abstract symbols, helps students develop a deeper understanding of mathematics.

With mathematics being so integral to our lives, students need to comprehend as much as possible about mathematics, and need be comfortable with it. As a society, we should want the best for our students, just as we do for our own biological children. Research confirms that manipulatives are wonderful teaching tools for elementary, middle, and high school students, including those with special needs. Granted, some research states that manipulatives are not effective teaching tools, and some teachers may shy away from manipulatives. Bellonio (2001, p. 5) offers a list of why some teachers are reluctant to use them:

1. Lack of training. Many teachers feel that they do not know how to teach using manipulatives and, therefore, are not comfortable using manipulatives and hesitate to use them in the classroom.
2. Availability of manipulatives.
3. Lessons using manipulatives may perhaps be noisier and not as neat. Using manipulatives works nicely in a cooperative learning setting.
4. A fear of the breakdown in classroom management. Manipulatives require a great deal of prior planning and organization.

All of these ideas are completely understandable and very true, but if teachers are willing to take a chance, they might open a whole new world of understanding for their students. Much of the research concludes that manipulatives greatly benefit students. “Manipulatives help relieve boredom in students, they offer a change from the textbook (abstract) method of learning allowing students to explore and use their imagination. Manipulatives provide a picture of a math concept that appeals to visual/spatial learners” (Bellonio, 2001, p. 3). Moyer and Jones (2004, ¶ 12) add, “Students who are given the autonomy to use manipulatives would, therefore, have the opportunity to initiate and regulate their own mathematical decisions, judgments, and behaviors, thereby exercising some control over the experiences they have that determine what mathematics they construct and how.”

Unfortunately, the stigma that surrounds mathematics may not be easily overcome. There may always be those who sigh or moan when the subject of math comes up. While some people’s abilities naturally lean toward math and some do not, math teachers owe it to their students to make math as interesting, as possible, and to reduce math anxiety and fear. Manipulatives provide a method of accomplishing that goal. They add elements of reality and practicality that are difficult to find in a text book. Manipulatives can help “turn on the light” for those students who are having difficulty grasping the principles of mathematics. Teachers should make extensive use of manipulatives, wherever possible, with their students.

Data Collection and Results

Method and Design

Through this action research, an effort will be made to determine whether the use of manipulatives improves the ability to understand the concepts of advanced mathematics and perform better in advanced mathematics. Mathematical work requires abstract thinking. Because this fact often makes mathematics more difficult to understand, the students need something to help to create a bridge to better understanding. Math manipulatives may provide a tangible method that the students could use to help achieve abstract thinking. Our goal, as teachers, is to create as much understanding, as possible, among students so we can help each and every child achieve maximum benefit from their mathematical training. Manipulatives should greatly assist in the understanding of mathematical concepts.

The goal of this research effort is to help make the teaching of advanced mathematics easier, and make mathematics more fun for high school students. This research will include Math IV students, all of whom are in the 12th grade. This research examines whether students gain a better understanding of mathematics through the use of the manipulatives, and whether teachers should be more inclined to incorporate manipulatives into all high school mathematics classrooms.

Negotiations

One of the most troubling aspects of this action research project is that manipulatives will be required for many students. Ideally, each student would have a full set of manipulatives, but, if funding is not available to purchase manipulatives for each student, work with the available manipulatives will be accomplished in groups.

Data Collection Ideas

- Divide students into control and experimental groups.
- Interview students.
- Observe mathematical problem solving with and without the use of manipulatives.
- Regular collection of student work.

Data Collection

Action research projects are pointless without the feedback of the students and teachers. Teachers need to keep track of both student and teacher reactions during the use of manipulatives. If the use of manipulatives proves unpopular or ineffective, why continue to use them? If students accept the use of manipulatives, and show improved understanding and performance in advanced math capability, why not incorporate them as regular classroom tools? If manipulatives are mentioned in a positive context, the use of manipulatives will be reinforced. To help determine the acceptance of manipulatives, a survey will be used among students. Based on survey results, student attitude toward the use of manipulatives may be evaluated. Other results will include pre- and post-testing, along with several grades given throughout the semester.

In addition, teachers need to observe students' expressions and body language during the classroom work to help determine the acceptance of manipulatives. Teachers will also determine whether the students improve their algebraic skills through classroom work. When the teacher collects and evaluates class work, the success in comprehending advanced mathematical concepts should be obvious.

Resources

- Manipulatives.
- Math IV textbook.
- Survey for students (see Appendix A).
- Assessment materials.

Results

The classes were divided into two groups. Class A had 21 students, consisting of 14 boys and 7 girls. Class B had 25 students, consisting of 11 boys and 14 girls. Both classes have students who are seniors and the courses are the same. Class A, the experimental group, was taught with the manipulatives; Class B, the control group, was taught with the traditional method. On the pre-test, Class A had an average score of a 18 on a scale of 100, and Class B had an average score of a 19 on the same scale. Obviously, none of the students knew the material very well. An exception did occur as one student in Class A scored 85 percent on the pre-test, and was the only student who passed the pre-test out of the entire study.

The same test was used as the post-test. Classes A and B each had an average score of 87 (see Figure 1). During the study, the students in class A were exposed to real-world-adapted mathematical situations, while the other students were not. In terms of test score, the use of manipulatives had no impact. Subjectively, however, the class using the manipulatives seemed to enjoy the experience better than those who did not. This fact may address the issue of decreasing math anxiety in students. Further study is needed to determine whether manipulatives decrease math anxiety, regardless of the impact on actual test score.

Classes	Pre-test Average	Post-test Average
A	18	87
B	19	87

Figure 1. Class means.

Conclusions and Recommendations

This action research project was undertaken to determine whether the use of manipulatives should be expanded for use among high school students, as they often are with elementary students. An obvious and logical use of manipulatives among older students is in mathematics, a discipline that is often misunderstood or feared because of the memorization and abstract thinking required to be successful. I hope the research will indicate that manipulatives will make hands-on math a more enjoyable activity, thereby removing the stigma that often haunts mathematics, and making it more understandable. However, the data from this research shows the students had nearly the same scores when manipulatives were used as when they were not. My research shows however, that the students enjoy the use of manipulatives, which leads to more questions. Can we improve teaching with the use of manipulatives enough to make a difference for the better? Will the cost of providing manipulatives for teachers be too much, and can schools fund enough manipulatives to make a difference? This research did show that manipulatives pique the interest of high school students in appreciating mathematics, and might help students learn better. However, this study did not show conclusive evidence that manipulatives will work every time or will be sufficiently effective for teachers to abandon traditional methods of teaching in favor of manipulatives.

References

Barta, J. (2002). Virtual manipulatives. *Teaching Children Mathematics, 9*(3), 132.

Bellonio, J. L. (2001). *Multi-Sensory manipulatives in mathematics: Linking the abstract to the concrete.* Yale-New Haven Teachers Institute. Retrieved April 1, 2005, from http://www.yale.edu/ynhti/curriculum/units/2001/6/01.06.12.x.html

Ernest, P. S. (1994). *Evaluation of the effectiveness and implementation of a math manipulative project*. (ERIC Document Reproduction Service No. ED391675)

Hodge, T. (2003, April). Web-based manipulatives. *Teaching Children Mathematics, 9*(8), 461. Retrieved April 1, 2005, from Tennessee Electronic Library.

Moyer, P. S., & Jones, G. M. (2004, January). Controlling choice: Teachers, students, and manipulatives in mathematics classrooms. *School Science and Mathematics*, *104*(1), 16-31. Retrieved April 2, 2005, from Tennessee Electronic Library.

Wisniewski, Z. G., & Smith, D. (2002). *How effective is touch math for improving students with special needs academic achievement on math addition mad minute timed tests?* (ERIC Document Reproduction Services No. ED469445)

Appendix A

Student Survey

1. Did your class use math manipulatives?

   YES or NO

2. Do you or would you like to solve mathematically problems using manipulatives?

   YES or NO

3. Did you or would you think that that the use of manipulatives was or would be helpful?

   YES or NO

4. Have you ever used math manipulatives before?

   YES or NO

5. Are you glad that your class had manipulatives? Do you wish that your class had used manipulatives?

   YES or NO

6. What did you like or dislike about the manipulatives?

7. Did your teacher provide plenty of examples during class to help you understand the problems?

8. Would you like to take another class that had manipulatives involved in it?

9. Did Coach Crowley help you understand math better than other teachers? Why?

10. Would you like to take another class from Coach Crowley? Why?

Using Children's Stories to Teach Math

Sharon Deaver

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-113.

Introduction to the Problem

Math is a subject that is difficult for many students to comprehend. They may struggle to try to understand the different concepts, but it just doesn't make sense to them. Many of them feel that learning math is like a downward spiral. It is very frustrating to the ones that want to understand math, but just can't. I should know, because I was one of these students in elementary school.

Many students that have difficulty in math, excel in language arts. I began to question whether combining language arts and math instruction may help the students who struggle in math. My study involves using children's stories to help teach math.

Review of Literature

Math is one subject that many children have a hard time understanding. This is probably because children often don't understand when they are ever going to use it (Albrecht, 2006). Teachers have the enormous task of trying to find ways that they can relate math instruction to students' everyday lives (Albrecht, 2006). After reading the book, *Math Curse*, by Jon Scieszka (Scieszka & Smith, 1995), Albrecht decided to have her students write their own math curse or story. The book by Scieszka tells a story of a girl who wakes up at a certain time everyday, takes a certain amount of minutes to get dressed, and a certain amount of time to eat breakfast, and the exact time the bus will arrive. This relates everyday situations to math. She must calculate the time it takes her to get ready in the morning to see if she will make it to the bus on time. The students used this story as an example when writing their stories. Albrecht used the following parameters for the project:

1. Write a story about a day in your life or the life of a character you've created. The day is one, 24-hour period that is changed by some outside event. This event might be

magical, like picking up a glowing protractor, or physical, like being knocked in the head by an old math book.

2. The story must be illustrated.
3. It may either be handwritten or completed on the computer.
4. The day should include 15 problems.
5. An answer key must follow the story.

One of the students in Albrecht's class was scared of math, but was excited about this project because she excelled in language arts. This was the first time the student had ever shown any interest or put forth an effort in math (Albrecht, 2006). The students also had an extra credit opportunity to answer their own question, "When are we ever going to use this?"

Teachers educating future teachers should support them in learning how to help students use language to explore mathematics (Schram & Rosaen, 1996). It is important for teachers to understand the relationship between the two subjects. For all students, understanding math lies in communication (Silbey, 2003). Silbey (2003) states, "Talking one's way through a problem, listening to others' solutions, and writing about the steps one took to solve the problem can help students to organize and consolidate their math thinking. Communication is, in fact, one of the five important NCTM process standards in mathematics" (Silbey, 2003, ¶3).

Most people probably do not realize the importance of understanding language arts skills before moving on to math. A big problem that many students face in math class is word problems, simply because they don't understand math when it is put into words (Bratina & Lipkin, 2003). Math involves plenty of vocabulary words, so it is important for students to begin working on their math language at an early age. For example, ask a student for the exact definition of a term such as perimeter, speed, prime number, etc. If the student cannot explain what the term means, it is unlikely that this problem will be solved (Bratina & Lipkin, 2003). One recommendation that Bratina and Lipkin (2003) suggest is to always include specific language arts activities in mathematics lessons. Word walls are a good example of a tool that can be used to increase students' mathematical vocabularies. They also suggest that teachers who include exercises such as true-false statements allow their students to understand more complex statements. For example, the students would read the following statements and classify each one as true or false: Some squares are rectangles, all squares are rectangles, no squares are rectangles, some rectangles are squares, all rectangles are squares, no rectangles are squares (Bratina & Lipkin, 2003). These statements require the students to understand the difference between all, some, and no. They must also know the definition of a square and a rectangle.

Teachers need to be able to express that there are often differences between mathematical language and everyday language (Bratina & Lipkin, 2003). For example, they found that some teachers defined "some" as "at least one but not all." While the definition of "some" may be used in everyday language, it is not correct in a mathematical context (Bratina & Lipkin, 2003). The National Council of Teachers of Mathematics Communication Standard states, "Instructional programs from pre-kindergarten through grade 12 should enable all students to use the language of mathematics to express mathematical ideas precisely (p. 128)" (NCTM, 2000). Using story problems is a good way to achieve this. Students should know the language well enough to explain how they determined the answer.

One reason that students may have problems working word problems is that they are bored with them (Martinez & Martinez, 2000). In order for a student to be able to understand a word problem, they must be able to relate to it. The result of turning word problems into good stories is more than just an interesting math lesson, it is a cross-curriculum learning experience that mixes language arts and math in a meaningful, productive way (Martinez & Martinez, 2000). Teachers should talk with their students to ascertain their interests. According to Martinez and Martinez (2000), teachers should ask their students questions such as:

- About what and whom do you like to read stories?
- What happens in the stories you like to read?
- Where would be a good place for a story?
- How should a good story end?

By gathering this information, teachers will be able to turn word problems into small stories about which the students will be interested. Martinez and Martinez (2000) also suggest that any story can be turned into a math story. For example, we can add distance, speed, and time values to *The Tortoise and the Hare*; or quantities and volumes of stored foods, as well as specifics about times and temperatures to *The Ant and the Grasshopper* (Martinez & Martinez, 2000).

Another approach to helping students understand word problems is turning around the process, so that students can write their own problems. The article, "The Answer is 20 Cookies. What is the Question?" (Barlow & Cates, 2006), suggests that students should be able to write their own word problems. The teacher gives the answer to a question, and then the students write their own problems that end with the answer the teacher has given. The teacher could make it simpler for younger grades, such as the answer is two, what is the question? For first grade, it could be made very simple, such as Anna has one cookie and Derek has one cookie, how many cookies do they have together. The reasoning for this activity is that, if students can work problems backwards, and write their own problem, they will have a better understanding of how to work a word problem (Barlow & Cates, 2006).

Summary

Math is a difficult subject for many students to grasp. It seems that much of the problem lies with the use of numbers instead of words. When students are able to use words to describe the problem, it seems that they are able to understand mathematics at a whole new level. I think that integrating language arts into math instruction will deepen student understanding of math. Using stories to teach math and having the students write their own stories will be beneficial and crucial, in my opinion, to student understanding of math. Being able to solve a problem is important, but having the ability to explain why the answer is the end result is even more important. Once students are able to explain this, they should have a good understanding of the process. Integrating language arts into math instruction will make this possible.

The questions I intend to answer include: What areas, in particular, are students struggling with in math? Why are they having a difficult time with this particular area? What can I change to help improve their understanding of this area? Will using stories to teach math help improve their understanding?

Data Collection and Results

Methodology

Subjects

The participants in this study will be the students in my first grade classroom, in which I will be student teaching at a local elementary school. The school is located in a rural area in Hamilton County, Tennessee. The population of the school is primarily Caucasian. My classroom contains 19 students, 5 of which are girls, and 14 of which are boys. Of the 19 students, only 10 returned the consent form. The remaining nine students’ results will not be reported. This classroom is an inclusion classroom. It must be taken into consideration that the majority of students in this classroom are below grade level in reading and math. Students are not randomly selected.

Materials

The materials I will need to complete my study include children's books that contain math skills.

Procedure

In this study, language arts will be integrated into math instruction. I talked to the classroom teacher and discussed her approach to teaching math. She said that she occasionally will use children's books to help introduce new skills, but not often. We discussed what skills the students will be introduced to over the next few weeks. After reviewing the curriculum, we decided that it would be best to use two different skills to compare to each other. The first one will be taught in a traditional way. The second one will involve the use of children books. The students will be given a pre-test and a post-test on each skill that is taught.

The classroom teacher and I agreed that the first skill should be missing addends. She said that the students always have trouble with missing addends. We spent about one week working on this skill. The second skill I introduced was a combination of both fractions and estimation. The reason why I decided to include two skills on the second part is because the teacher said that students seem to pick up on fractions rather quickly. She said that estimation tends to be more difficult for them to grasp. She said that estimation and missing addends would be more comparable as far as level of difficulty. I spent about 2 weeks teaching fractions and estimation.

Results

After reviewing the results of the students' pre-tests on missing addends, it was apparent that about half of them figured out how to solve them on their own. The other half had no idea what they were supposed to do. Instead of finding the missing addend, it appeared they added the two numbers that were given. Some of the others appeared to write random numbers.

The post-tests on missing addends showed a tremendous increase from the pre-test. All of the students scored either a 90 or 100, except for one, who scored a zero. The student that scored a zero added the two numbers that were given, instead of finding the missing addend. The results are shown in Figure 1.

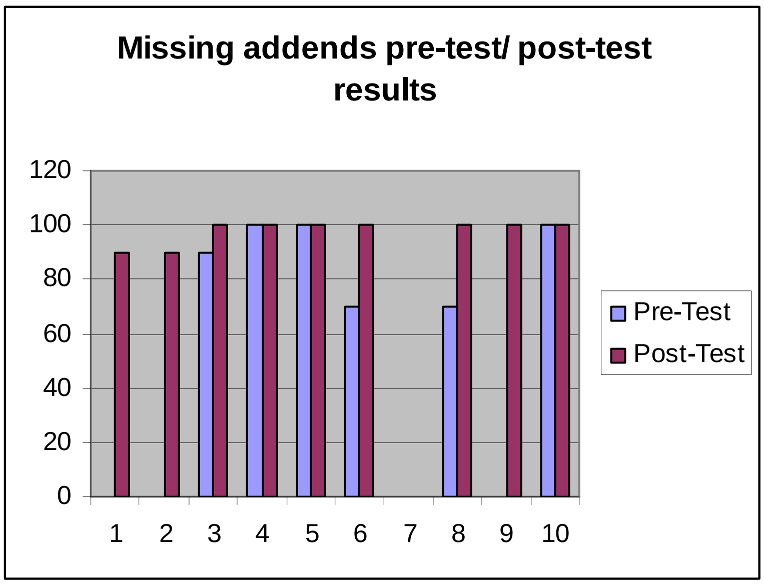


Figure 1. Missing addends pre-test/post-test results.

On the fractions/estimation pre-test, the scores varied greatly. There were two zeros, and the highest score was 50. I noticed that the students seemed to estimate extremely low. The post-test did not show as big of a difference as I had originally hoped. However, all but one student showed an increase. This was the same student that did not show an increase on the missing addends pre-/post-test. The results of the fractions/estimation pre-test/post-test are shown in Figure 2.

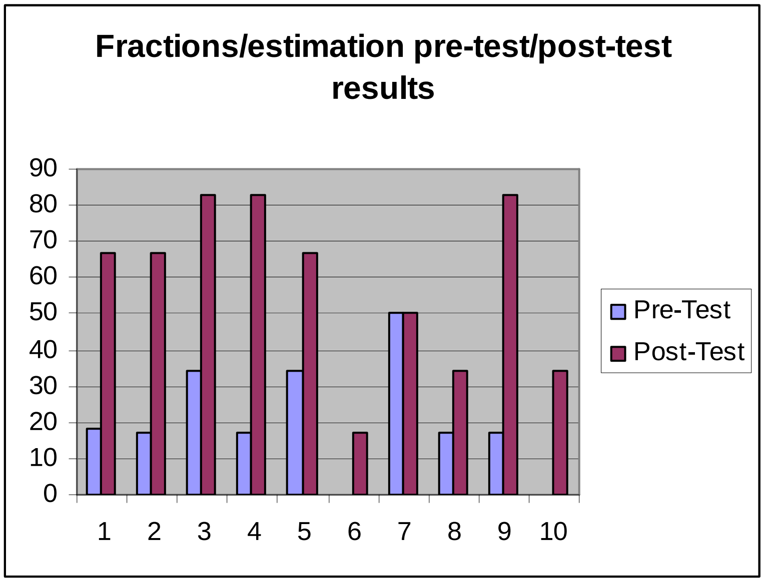


Figure 2. Fractions and estimation pre-test/post-test results.

I feel that estimation is a very difficult skill for first grade students to grasp. Even though I showed them different strategies they could use to estimate, they still seemed to underestimate by quite a bit. I probably should have selected a different skill on which to focus since there is no concrete answer in estimation. When grading these post-tests, I looked at whether or not the estimation was more reasonable when compared to the pre-test. Overall, estimations were much closer for the post-test than for the pre-test.

I did see a significant increase from pre-test to post-test for each skill that was taught. However, there were several students that had already mastered missing addends, before the topic was taught. The students started out with much lower scores on the fractions and estimation test. A breakdown of all the pre-test and post-test scores are shown in Figures 3 and 4. Test 1 refers to the missing addends pre- and post-test. Test 2 refers to the fractions and estimation pre- and post-test.

	Pre-Test 1	Post-Test 1	Difference	Pre-test 2	Post-test 2	Difference
1	0	90	90	17	67	50
2	0	90	90	17	67	50
3	90	100	10	34	83	49
4	100	100	0	17	83	66
5	100	100	0	34	67	33
6	70	100	30	0	17	17
7	0	0	0	50	50	0
8	70	100	30	17	34	17
9	0	100	100	17	83	66
10	100	100	0	0	34	34

Figure 3. Differences between pre-tests and post-tests.

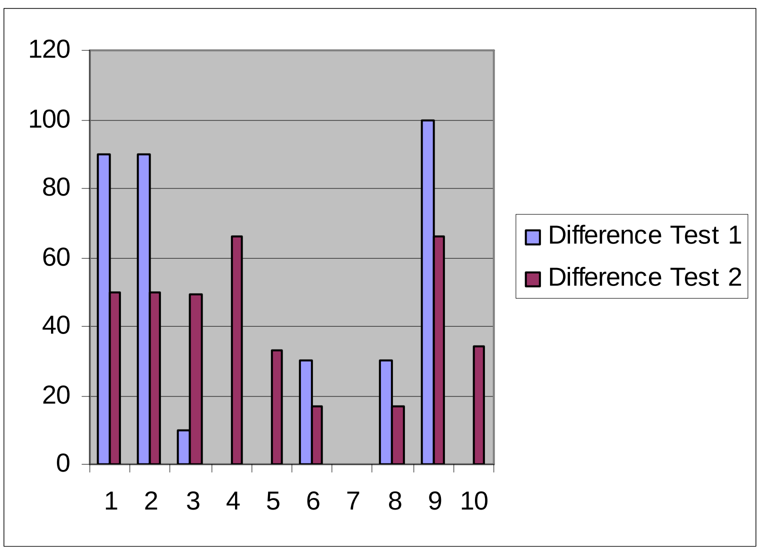


Figure 4. Difference between test 1 and test 2 results.

According to the chart, it looks like there was a greater difference on test 1, than on test 2. However, I added the difference points to compare test 1 and test 2. The difference on test 1 was 350 points. The difference on test 2 was 382 points. The students actually showed more of an increase on test 2 than they did on test 1. (See Figure 5.)

Difference Test 1	Difference Test 2
90	50
90	50
10	49
0	66
0	33
30	17
0	0
30	17
100	66
0	34
Total 350	Total 382

Figure 5. Total difference between test 1 and test 2.

Conclusions and Recommendations

Conclusions

I was hoping that there would have been more of a difference from test 1 to test 2. I think that if I taught different skills than the ones I chose, I may have seen more of a difference. Test 2 did show a greater difference than test 1. According to my study, using children's books did make more of a difference than just teaching the skills in a traditional manner.

Recommendations

I would recommend that teachers begin using children's books as a way to introduce new math skills to students. I would have liked to have the children write their own math stories, as mentioned earlier, but, unfortunately, there was not enough time.

I think it is important that teachers begin to implement this research in their own classes to see if they find it effective. It could vary from classroom to classroom, but I think that the overall results would be very similar to my own findings.

Teachers could further the research by ascertaining the interests of their students. The teacher could group the students together and select certain books that contain both math and something that interests them. They could work in small groups with the books that are selected for their interest groups. I feel that, if the books are selected by what interests the students have, then the results could be even greater than just using children's books alone.

I feel that every teacher could benefit by using children's books in their math curriculum. Most students at the elementary school age enjoy having books read to them. By selecting books that contain math skills, the teacher can achieve two things at once: both reading and math. This will benefit the teachers, as well as the students. The best part is that the students will be learning math, and not even know it!

References

Albrecht, C. (2006). Lift the math curse. *Teaching K-8, 36*(4). Retrieved February 24, 2007, from Wilson Web.

Barlow, A., & Cates, J. (2006). The answer is 20 cookies. What is the question? *Teaching Children Mathematics, 13*(5), 252-255.

Bratina, T, & Lipkin, L. (2003). Watch your language! Recommendations to help students communicate mathematically. *Reading Improvement, 40*(1) 3-12. Retrieved February 24, 2007, from Wilson Web.

Martinez, J., & Martinez, N. (2000). Teaching math with stories. *Teaching PreK-8, 30*(4), 54-60. Retrieved February 25, 2007, from Wilson Web.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics.* Reston, VA: Author.

Schram, P., & Rosaen, C. (1996). Integrating the language arts and mathematics in teacher education. *Action in Teacher Education, 18*(1), 23-38. Retrieved February 24, 2007, from Wilson Web.

Scieszka, J., & Smith, L. (1995). *Math curse.* New York, NY: Viking.

Silbey, R. (2003). Math out loud! *Instructor, 112*(7), 24-26. Retrieved February 24, 2007, from Wilson Web.

Appendix A

Missing Addends Pre-/Post-Test

Directions: Find the missing number

1) 5+___= 10

2) 2+___= 6

3) ___+ 4 = 8

4) 8+___= 10

5) 2+___= 4

6) ___+3 = 5

7) 4+___ = 7

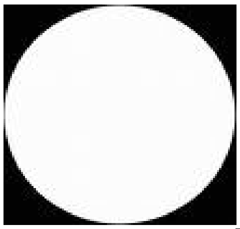
8) ___+4 = 9

9) 2+ ___ = 3

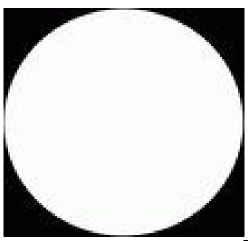
10) ___+ 1 = 2

Appendix B

Fractions and Estimation Pre-/Post-Test



______________Color ½ of the pizza red



______________Color ¾ of the pizza yellow

Estimate the number of jellybeans in the jar __________

Estimate the number of students in your class ________

Estimate the number of rocks in the cup ___________

Estimate how many skittles it will take to fill the cup _______

The Effect of Book Selection on Reading Quiz Grades and Enthusiasm Level of High School Students

Ryan Dixon

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-111.

Introduction to the Problem

There is much debate in the world of English education about what type of literature should be taught in high school. While some traditionalists are of the opinion that the classics should be defended and exclusively taught at all costs, others are of the opinion that the same themes that are present in the classics are present in modern, young-adult literature. Advocates of teaching young-adult literature in high school classrooms argue that the books deal with the same timeless themes that are present in the classics, but they present situations, language, characters, and settings that resonate with modern high school students.

Most proponents of adolescent literature agree that Shakespeare, Chaucer, Homer, Hemingway, and Steinbeck are important and should be part of the curriculum. However, they argue that these pillars of the western cannon should be paired or alternated with some of the widely-acclaimed and beautifully-written adolescent literature produced between the late 1960s and the present day. The idea is that, while the great books of yesterday wrestle with important and lofty issues that deal with humanity's ongoing search for truth, young-adult writers deal with issues such as puberty, dating, and relationships with friends and parents. Moreover, they place their adolescent protagonists in positions where they must make ethical and moral decisions. In short, they make students think about their own lives.

The purpose of this study was to test the effect of reading selection on student academic performance and motivation level in a secondary setting. Many high school English teachers will point out that it is difficult to motivate many students to read. Many students do not consider reading to be an enjoyable past-time, and, until students begin reading more at home, their grades will reflect their disdain for the activity.

Review of Literature

Although there is much research that shows the benefits of adding adolescent literature to the curriculum, the subject is one of great controversy in many school districts. Critics of adolescent literature see it as weak, “faddish,” and full of obscene language, and sexual content (Davis, 1982). It is viewed by some as being a lesser form of literature. However, many teachers and researchers have found this to not be true, at all. Researchers have found adolescent literature to be attractive to students because the characters involved use moral reasoning in a way that is true to the moral reasoning that the students themselves actually use (Carroll, 1994).

Bath (1974) argued against the assertion that young-adult books are “junior novels” (p. 130), and pointed out that this can only be said about texts that were written very early in the history of the genre. Bath argues that young-adult literature is now more sophisticated, containing “three dimensional characters that mirror the concerns of adolescents” (p.130).

Carroll (1994) believes that adolescent literature is important because we are dealing with a “new generation” of young people whose lives are affected by the content of talk shows and other aspects of pop culture. This genre of literature deals with the themes that saturate our society.

George (2000) found that many teachers are enthusiastic about teaching adolescent literature, but many of them are uneducated about what books are available for instruction. Teachers interviewed by George indicated that, whenever they did teach a work of adolescent literature, the student response was overwhelmingly positive. George’s study suggests that the apparent stubbornness of many schools against including modern works of young-adult literature comes from a general ignorance about the existence of these books. Gale (1999), a publisher, notes that most school reading lists do not offer selections that were published “in the last twenty years" (p. 9). This is a sad truth, because there are many good writers who have been publishing great books during the last 2 decades.

Probst (1987) argues in favor of replacing some "traditional" texts with "young-adult" texts because of the distorted view of literature that many high school classrooms unwittingly instill in students. Because certain works, such as those of Shakespeare and Chaucer, *must* be taught, at all costs, the study of literature becomes more about the "information it imparts" rather than the "experience it enables us to have" (p. 27). It should be the goal of a high school English curriculum to connect the experience of characters in a work of literature with experiences in the students' lives.

In a survey of 380 students, conducted by Bushman (1997), many students indicated that they found the literature traditionally assigned to be "boring," and that they used study guides to help them understand many texts. The survey also indicated that the selections made by students for outside reading came from young adult book lists. The results of Bushman's study led him to believe that "schools are developing non-readers" (p. 35).

It is extremely important that our students develop an appreciation for books and learn to read for pleasure. Many literacy problems in America, today, seem to be exacerbated by the fact that students are not reading. In an article by Roberts (2006), the author suggests that poor literacy is tied to a "lack of good books, an absence of reading models, and little time devoted to reading" (p. 24). The use of adolescent literature could help to motivate students to read for pleasure. Evidence shows that pleasure readers score higher on standardized reading tests (Kaczmarec & Stachowiak, 2004). Kaczmarec and Stachowiak suggest that making books "accessible and relevant" (p. 55) by combining young-adult literature and "the classics" may be a way to boost the amount of time students spend reading for pleasure.

After reading the reactions of teachers and looking at the literature, it is evident that the majority of our nation's students do not love to read. Our classrooms often have a climate that reduces books to sources for answers to questions asked by teachers. In a survey conducted by Strommen and Mates (2004), students indicated that they often skim a text to find answers to a teacher's questions, and do not read a work in its entirety. This is a problem. It forms a connection between individuals and books that is negative—that misses the point of literature—and that is often carried beyond high school.

Data Collection and Results

Procedures

During a ninth-grade poetry unit, taught during a 3-week period, I introduced a young-adult novel, by Karen Hesse, to two honors classes. The novel, *Out of the Dust*, was selected because it is written in the style of a narrative poem, which would allow it to be integrated into a unit based on state Language Arts standards. It was also selected because of its teenage protagonist. Because the focus of my study was both qualitative and quantitative, I used attitude surveys and reading quizzes to collect data (See Appendices A, B, and C.)

Data from this study is from the performance of 23 honors English students who assented to participate. Twelve of the students were from a first-block class, and 11 were from a third-block class. Over the course of the 3-week period, the traditional poetry of the unit was taught using state-issued textbooks. During the last 30 minutes of certain classes, students engaged in either silent reading or class discussion, based on *Out of the Dust*. No other changes were made to the curriculum other than the addition of this young-adult novel.

At the beginning of the 3-week unit, an attitude survey was given to first- and third-block, ninth-grade honors classes. The survey asked students basic questions about their reading habits, the sorts of books and characters that interest them, and the extent to which book selection affects their interest and performance in class. Then, as the unit unfolded, students were given a series of four quizzes, based on the content of their reading. Two of the quizzes were based on the traditional literature of the curriculum—material found in textbooks over multiple editions. The other two quizzes were based on *Out of the Dust*. The quizzes were designed in consideration of multiple learning styles, containing multiple choice, short answer, and essay questions. The last quiz consisted of an essay based on *Out of the Dust*. This quiz was designed to determine what level of mental connection students had made with the text. This final quiz was graded based on the complexity of the student's response to a central question. At the end of the 3-week period, a final attitude survey was administered, asking students general questions about their opinions of *Out of the Dust*.

My hypothesis was that students would make better grades on reading quizzes based on *Out of the Dust* than they would on quizzes based on the poetry found in the ninth-grade English textbook. I also hypothesized that attitude surveys would reveal an overwhelming preference for young-adult books. For the purposes of this study, student grades are based on the following scale: (a) A = 90-100, (b) B = 80-89, (c) C = 70-79, (d) D = 60-69, and (e) F = 60 and below.

Results

The results of the first attitude survey (see Figure 1) showed that 38% of all students surveyed do not read, at all, outside of class. However, the survey shows that 45% of students sometimes consider reading an enjoyable past-time. Over half of all students surveyed indicated that they might be interested in books that dealt with their hobbies and interests, and nearly half indicated that their academic performance is slightly affected by reading selection.

How many hours per
week do you spend

reading outside of	1-2	2-4	4-6	Over 6 hours	Never read
class?	31%	14%	12%	5%	38%
Do you consider reading an enjoyable	Yes	No	Sometimes		
past time?	24%	31%	45%		
Would you be interested in books	Yes	No	Maybe		
dealing with your interests?	36%	7%	57%		
How much does reading selection	Very much	Little	Not very much		
affect your interest and performance in class?	33%	43%	24%		

Figure 1. Student attitude survey 1.

Data collected from the poetry quizzes showed a difference in performance between first and third blocks. Class averages (see Figure 2) show that first block performed better academically on quizzes based on the young-adult selection. Third block out-performed first block by six percentage points on quizzes based on the traditional, curricular selections from the textbook. Third block and first block class averages of quiz grades, based on the young-adult novel, are exactly the same.

Poetry Quiz 1		**Poetry Quiz 2**		**Y-A Quiz 1**		**Y-A Quiz 2**	
1st Block	*3rd Block*	*1st Block*	*3rd Block*	*1st Block*	*3rd Block*	*1st Block*	*3rd Block*
88	90	88	100	80	100	80	100
68	99	50	92	100	100	80	90
93	72	100	88	100	100	100	100
85	76	92	73	100	80	90	70
89	100	85	100	100	60	70	90
75	99	65	92	70	80	70	90
89	99	96	96	100	60	70	100
99	93	96	100	100	100	100	100
76	93	77	96	100	80	70	70
92	99	85	96	100	80	60	90
85	94	96	92	100	100	100	90
91		96		80		90	
Av.	Av.	Av.	Av.	Av.	Av.	Av.	Av.
86%	**92%**	**86%**	**93%**	**94%**	**85%**	**82%**	**90%**

Figure 2. Grades and class averages for traditional and young-adult quizzes.

After combining the grades of all 23 students, the mean percentage grade for all traditional poetry quizzes was 89%, while the average for young-adult literature quizzes was 88%. With just a percentage point between the two averages, the two types of literature are at a virtual tie. However, there were more “A” grades for *Out of the Dust* quizzes than there were for traditional poetry quizzes in first block, but not in third block (see Figures 3 and 4). The combined number of each letter grade awarded for all students shows the same number of A and B grades for traditional literature quizzes and young-adult literature quizzes (see Figure 5).

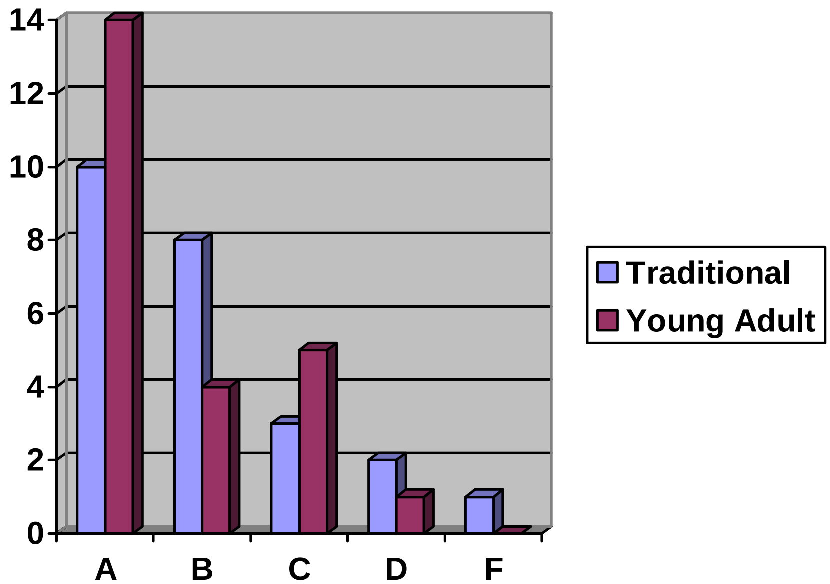


Figure 3. First block: Number of letter grades awarded for reading quizzes.

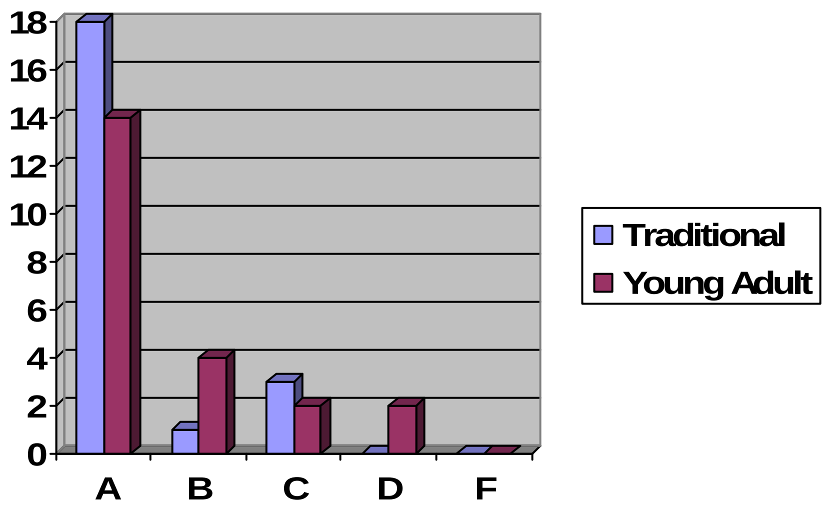


Figure 4. Third block: Number of letter grades awarded for reading quizzes.

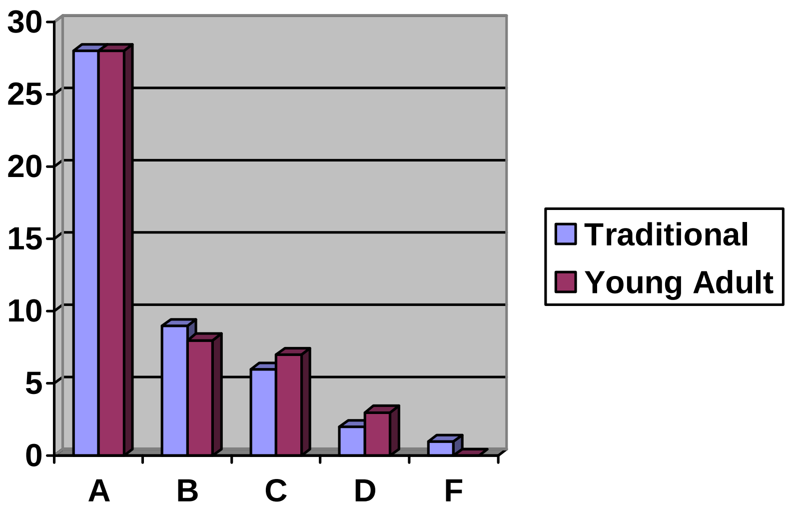


Figure 5. Total number of each letter grade for all students.

The final attitude survey administered to all students revealed overwhelming dissatisfaction with the content of the young-adult novel selected for the class (see Figure 6). Students were asked to respond to a series of questions about the book by using a number scale. An answer of 4-5 indicated agreement with a question, 3 indicated neutrality, and 1-2 indicated disagreement. In response to the statement, “I would recommend this book to my friends,” 45 percent of students responded with 2 or 1. Seventy-seven percent of students surveyed said that they did not talk about the book at all outside of class. Seventy-one percent of students responded with a 1 or 2 for the statement, “I found *Out of the Dust* to be an important book that I could relate to.” Many students who expressed distaste for the book indicated, on the survey, that the setting of the book (the Dust Bowl) did not interest them.

Student Responses To Survey 2: 5 (highest) to 1 (lowest)

	1-2	3	4-5
I found *Out of the Dust* to be a book that I could relate to.	71%	13%	16%
The book held my attention and I was concerned about the plot.	36%	32%	32%
I talked about the book with my friends outside of class.	77%	13%	10%
Class discussion kept me interested in the book.	45%	39%	16%
I would recommend this book to my friends.	45%	29%	26%

Figure 6. Student responses to attitude survey 2.

Conclusion and Recommendations

It is evident from the data collected that book selection had little effect on student academic performance. The subjects observed performed better by one percentage point on quizzes dealing with traditional literature than they did on quizzes dealing with young-adult literature. First block students earned a higher proportion of “A” grades on young-adult reading quizzes, but the overall performance of students suggests that book selection has little to do with student academic performance.

Many students found the young-adult selection to be “boring” or “uninteresting.” The majority of these students indicated that the setting and topic of the book were the main causes for their lack of interest. Many researchers have found that students are more interested in reading books about characters that are their own age. This study suggests that student motivation to read may be impacted by the topic and setting of a book, as much as by the age of the book’s characters. The grades awarded during this period show almost identical averages for both types of literature. It is possible that ninth-grade students view any book “assigned” in the classroom as “class” material, regardless of the age of the protagonist or the setting of the book.

Considering the grades earned by first block students, who scored a higher number of “A” grades on young-adult quizzes than traditional literature quizzes, it is possible that classroom climate has a lot to do with student academic performance. The types of discussion that developed organically in that class may have contributed to higher levels of understanding for the content of the book. However, a major concern of this study was to learn how to cultivate a life-long love of reading in students. Since over 70 percent of all students indicated that they found the book to be uninteresting, it may be unlikely that this particular selection achieved that goal. An adjustment to this study could analyze student enthusiasm based on book selections that the students, themselves, choose. The setting and plot of a book seem to have such an impact on student enthusiasm. Therefore, if we give students more freedom to choose books, based on their own personal interests, we may see an increase in student motivation to read for pleasure.

References

Bath, R. J. (1974). ERIC/RCS Report: Teaching adolescent literature. *The English Journal, 63*(2), 130-150.

Bushman, J. H. (1997). Young adult literature. *The English Journal, 86*(3), 35-40.

Carroll, P. (1994). The research connection. *The ALAN Review, 22*(1).

Davis, J. A. (1982). Young adult literature: A bridesmaid once again. *The English Journal, 71*(6), 77-79.

Gale, D. (1999). What teens are reading: A publisher's perspective. *Journal of Youth Services in Libraries, 13*(1), 9-12.

George, M. (2000). Researching the implementation of faculty book clubs in an urban middle school. *The ALAN Review, 28*(1).

Kaczmarek, N., & Stachowiak, M. (2004). Independent reading is key to lifelong learning. *Momentum, 35*(1), 54-58.

Probst, R. E. (1987). Adolescent literature and the English curriculum. *The English Journal, 76*(3), 26-30.

Roberts, J. (2006). Building a community of high school readers. *Knowledge Quest, 35*(1), 24-29.

Strommen, L. T., & Mates, B. F. (2004). Learning to love reading: Interviews with older children and teens. *Journal of Adolescent & Adult Literacy, 48*(3), 188-200.

Appendix A

Student Attitude Surveys

<u>Pre-Test</u>

1. How many hours per week do you spend reading outside of class?

    a. 1-2 hours
    b. 2-4 hours
    c. 4-6 hours
    d. over 6 hours
    e. I do not read outside of class

2. Do you consider reading an enjoyable past-time?

    Yes No Sometimes

3. What sorts of books do you enjoy reading?

4. What sorts or characters interest you?

5. Think of some of your hobbies and interests. If you knew that there were books written with your interests in mind, would you be interested in reading them?

    Yes No Maybe

6. How much does a reading selection affect your interest and performance in class?

    a. very much
    b. a little bit
    c. not very much
    d. very much

Post-Test

For the following survey, place a number from 5 (the highest) to 1 (the lowest) at the end of each sentence to express your agreement with each statement concerning *Out of the Dust.*

1. I found *Out of the Dust* to be an important book that I could relate to. _____

2. *Out of the Dust* held my attention and I was concerned about the plot. _____

3. I talked about *Out of the Dust* with my friends or family outside of class. _____

4. Class discussion about *Out of the Dust* kept me interested in the book. _____

5. I would recommend this book to my friends. _____

6. If you gave a response of 3 or below for question five, please explain why in two or three sentences.

7. In your opinion, did the stylistic form of *Out of the Dust* make it harder or easier to follow? Why?

8. If more books like *Out of the Dust* were taught in English class, would you be more or less interested in reading? Explain.

Appendix B

Reading quizzes - Traditional Poetry Selections

Quiz 1: Poetry—Edgar Allan Poe

Example of	
Alliteration	1. 2. 3.
Assonance	1. 2.
Label the rhyme scheme in this stanza	It was many and many a year ago, In a kingdom by the sea, That a maiden there lived that you may know As the beautiful Annabel Lee; And this maiden she lived with no other thought Than to love and be loved by me.
Internal rhyme	1. 2.
Near rhyme or slant rhyme.	1. 2.
Repetition	1. 2.
Define: Narrative poem.	
Which poem is a narrative poem: “Annabel Lee” or “The Bells?”	
What event does each bell represent?	1. Silver- 2. Gold- 3. Brass 4. Iron-

Quiz 2: Poetry—Narrative Poem and Ballad

1. Name one major difference between a folk ballad and a literary ballad.

2. Name two aspects of ballad that are found in "O what is that Sound?"

3. What is the main difference between a narrative poem and a ballad?

4. How many speakers are there in "O what is that Sound?" Give one word to describe each speaker's state of mind.

5. How does the rhythm of "O what is that Sound" contribute to its meaning?

6. What point of view is "The Wreck of the Hesperus" written in?

7. What aspects of a story are also found in a narrative poem:

   a. characters
   b. plot
   c. figurative and descriptive language
   d. theme
   e. all of the above

8. Which choice best describes the father in "The Wreck of the Hesperus?"

   a. old and wise
   b. arrogant and cocky
   c. humble, like Christ
   d. young and brave

9. Find one example of both of the following in either of the two poems:

   a. alliteration
   b. simile

10. Give an example of *allusion* in "The Wreck of the Hesperus."

Appendix C

Reading quizzes - *Out of the Dust*

Quiz 1: *Out of the Dust* - Winter, 1934

1. In the first section of *Out of the Dust*, we learn about Billie Jo's special talent, which is

   a. writing poetry
   b. plowing the fields
   c. baking apple pie
   d. playing the piano

2. How does Billie Jo's mother feel about her daughter's talent?

3. How would you describe Billie Jo's father's attitude toward the drought and dust?

4. Billie Jo feels guilty about how she feels after her friend moves to California. What is she guilty about?

5. Give one example of how the dust affects Billie Jo's life.

Quiz 2: *Out of the Dust*

Write an essay on the following topic. Give examples from the book to back up your response.

If you were Billie Jo, would you leave your family to pursue your talent? Is it ever right to leave your family in Billie Jo's family's circumstances? What decision do you think Billie Jo will make? Why?

Parents, Children, and Reading at Home: To Read Aloud or Not to Read Aloud? That is the Question!

Cindy Dodson

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-096.

Introduction to the Problem

In looking back on my early years in school, when I was an emergent reader, my fondest memories are of being read aloud to by my parents and teachers. Whether I was hearing a favorite book over and over, or I was hearing a new book for the very first time, each instance of hearing those words aloud was an opportunity for a new adventure. Hearing those words read aloud made me want to read them myself. I wanted to read independently, rather than having to wait for someone else to take me to another world only found in these beloved books. In my recent experiences in the classroom, I am aware that teachers are under a great deal of pressure to meet an enormous number of standards. This mounting pressure limits the time teachers have to read with their students.

Another concern for education is the fact that many children do not consider reading a meaningful pastime. They have too many other forms of entertainment vying for their attention – video games, the Internet, and television, to name a few. Coupled with the fact that families have incredibly busy lifestyles, parents have less and less time to read with their children, or to do any reading themselves.

Actually hearing books read aloud can bring them to life for children, perhaps striking their curiosity, and, hopefully, in turn, will inspire them to read on their own. The ultimate goals of reading aloud to children are to nurture their love of reading, and to strengthen their literacy skills. Reading aloud can nurture children’s imaginations, strengthen their listening skills, and further develop their language skills. Parents who read aloud to their children are taking a proactive step in helping their children become life-long readers. The purpose of this study is to determine if parents would be willing to participate in a home reading program, and to determine if this type of program increases the children’s desire to read.

Review of Literature

There is a great deal of research available on the importance of reading aloud to children, no matter what their age. Most teachers agree it is beneficial to read aloud to young students because these children are in the early stages of their reading development. Any exposure they can get to reading is going to bolster their knowledge and confidence in reading. According to Jim Trelease, reading aloud instills the value of reading, and nurtures students’ abilities and skills in reading, writing, and listening (Trelease, 1990).

In addition to strengthening literacy skills, reading aloud can also be used to encourage a lifetime reading habit in students. Reading meaningful and interesting stories to students can help students develop a positive attitude toward reading (Trelease, 1989). By selecting a variety of interesting read-alouds, teachers and parents can show students that reading can be fun and entertaining, and, hopefully, they will be inspired to try to read on their own.

Reading comprehension is one of the most important indicators of student success in school. Without comprehension, reading would be pointless and void of meaning (Casper, Calton, & Westfall, 1998). Read-alouds by parents and teachers can be very effective in strengthening student comprehension because, as indicated by Trelease (1989), children can listen at a higher level than they can read.

Reading aloud to children can help them gain a deeper understanding of the stories, which will help them become stronger readers. In turn, they will be motivated to read independently (Kieff, 2003). Strengthening reading comprehension skills can give less able readers the confidence they need to read on their own.

Parents partnering with schools can do a great deal to further their children’s literacy development (Moss & Fawcett, 1995). Parents can model good reading habits for their children by reading in front of their children, as well as reading aloud to their children. If children do not see their parents reading during their free time, they will be less likely to read for a recreational activity. Parents can limit the time their children play video games or watch television, and encourage them to look at or read a book, instead. Parents can help their children become stronger readers by making reading together a meaningful family activity. Children learn to read by being read to – if children are read to everyday, their chances of becoming fluent, lifelong readers are greatly increased. Children whose parents are involved with their education have greater reading achievement (Zellman & Waterman, 1998). However, in order for this home-school reading partnership to work, the teacher and parents must have clear lines of communication, and parents must be committed to their children's literacy development.

Data Collection and Results

Purpose

The purpose of this study is to gather information with regard to whether or not parents would be willing to participate in a home reading program, and to determine if the implementation of this type of program has a positive effect on children's attitudes toward reading. Hopefully, having a home reading program will encourage parents to spend time each day reading aloud to their children, and, in turn, children will become more proficient, motivated readers.

Procedure

Location. The study took place in a kindergarten classroom in Chattanooga, Tennessee. This particular school was chosen because of the researcher's relationship as a student teacher in this school. The school is a traditional, public school, and the students come from racially diverse backgrounds, as well as a wide range of socioeconomic backgrounds. This kindergarten classroom was comprised of 20 students – 8 boys and 12 girls. There were 5 African-American students, 13 Caucasian students, and 2 English-speaking Hispanic students. They are all developmentally diverse.

The survey instrument. The actual instrument consists of a set of questions. No name or personal information is requested. A pre-research survey about reading was sent home for the parents and children, prior to the implementation of the reading log. The reading log and book were then sent home for a 2-week period. At the end of this period, the post-research surveys were sent home for both parents and children to determine if the reading logs had any effect on the time spent reading aloud or attitudes toward reading (see Appendix A).

The respondents. Out of the 20 pre-research surveys distributed, 16 parent surveys and 16 student surveys were returned (see Figures 1 and 2).

Everyday	5-6 days per week	3-4 days per week	1-2 days per week	Never
2	3	8	3	0

Figure 1. The number of parents and times per week they read to child.

Enjoy books	Like being read to	Like reading during free time	Like getting a book for a present
14	16	14	16

Figure 2. The number of students and feelings about books.

After these pre-research surveys were returned to school, reading logs and books were sent home each night with the children participating in the study. The reading logs were sent home for a 2-week period. The students had a positive attitude each day, regarding the reading log.

At the conclusion of the reading log period, post-research surveys were sent home to determine if the reading aloud program had an effect on the amount of time parents spent reading with their children, or on children's attitudes towards reading (see Figures 3 and 4).

Everyday	5-6 days per	3-4 days per	1-2 days per	Never

	week	week	week	
10	4	2	0	0

Figure 3. The number of parents and times per week they read to child.

Enjoy books	Like being read to	Like reading during free time	Like getting a book for a present
14	16	14	16

Figure 4. The number of students and how they feel about books.

Results

The pre-research surveys indicated that both parents and students had a positive attitude toward reading. Over 80 percent of the parents reported that they read to their children at least three to four times per week. None of the students reported having a negative attitude reading. Figure 3 indicates that there was a slight increase in the number of days per week parents read to their children. The number of parents reading to their children everyday increased from 12 percent to 62 percent. Figure 4 shows no change in the attitudes of the students toward reading or books, in general.

Conclusions and Recommendations

The research for this project indicated that reading aloud has a positive effect on parent and student attitudes towards reading, and it helps improve student literacy skills. Fortunately, this group already had a positive attitude towards reading, and the reading logs did not change the attitudes of the parents or the students. Frequency of read-alouds did increase for a number of families, which is a good indicator of the positive impact of home-school reading partnerships.

Schools should consider these reading programs because not all families may have access to books at home. This is an effective strategy to provide books to those parents who may not otherwise have the materials to read aloud to their children.

In creating a home reading program, the researcher would recommend having a strong home-school connection. There should be open communication between teacher and parents, so that the teacher knows whether or not parents have reading materials available at home. Teachers should also be aware that grant money is available to help supply books to send home for parents to read with their children.

In conclusion, the positive attitudes of this group, with regard to reading, indicated to the researcher that this research could be molded into a reading and writing program, depending on the abilities of the students. A home reading/writing log could be created to help students write about what they read.

References

Casper, M., Calton, J., & Westfall, S. (1998). Comprehension: Theories and strategies. Retrieved February 18, 2005, from http://faculty.dominican.edu/peters/comprehe.htm

Kieff, J. (2003). Revisiting the read-aloud. *Childhood Education, 80*, 28-32.

Moss, B., & Fawcett, G. (1995). Bringing the curriculum of the world of the home to the school. *Reading & Writing Quarterly: Overcoming Learning Difficulties, 11*, 247-256.

Trelease, J. (1989). *The new read aloud handbook*. New York: Penguin.

Trelease, J. (1990). Have you read to your kids today? *Instructor, 105*, 56-60.

Zellman, G., & Waterman, J. (1998). Understanding the impact of parent and schoolinvolvementon children’s educationaloutcomes. *The Journal of Educational Research, 9*(1), 370-380.

Appendix A

PARENT SURVEY
Pre-research Analysis

Please circle your answer.

1. How many days a week do you read TO your child?

   A. Everyday
   B. 5-6 times week
   C. 3-4 times a week
   D. 1-2 times a week
   E. Never

2. How many days a week do you read WITH your child?

   A. Everyday
   B. 5-6 times per week
   C. 3-4 times per week
   D. 1-2 times per week
   E. Never

3. Do you ask your child questions about books you read together?

   A. Yes
   B. No

4. Do you read in front of your child? (Books, magazines, newspapers)

   A. Yes
   B. No

Please list any comments or suggestions on the back. THANK YOU!

PARENT SURVEY
Post-research Analysis

Please circle your answer.

1. How many days a week do you read TO your child?

   A. Everyday
   B. 5-6 times week
   C. 3-4 times a week
   D. 1-2 times a week
   E. Never

2. How many days a week do you read WITH your child?

   a. Everyday
   b. 5-6 times per week
   c. 3-4 times per week
   d. 1-2 times per week
   e. Never

3. Do you ask your child questions about books you read together?

   a. Yes
   b. No

4. Do you read in front of your child? (Books, magazines, newspapers)

   a. Yes
   b. No

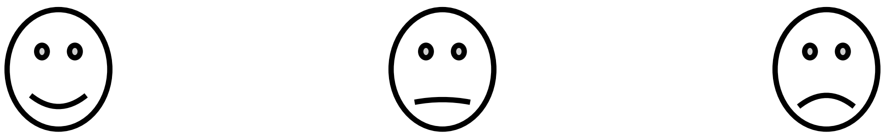
<u>Please list any comments or suggestions on the back. THANK YOU!</u>

STUDENT SURVEY
Pre-research Analysis

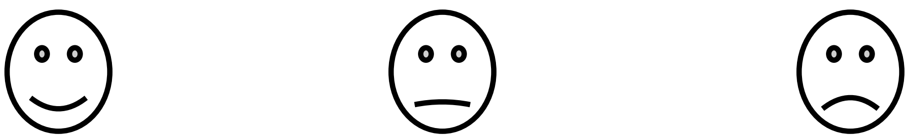
Please read the question to your child and circle the "face" which best describes your child's response. *Thank you for your time!*

SMILEY FACE – I like it.
STRAIGHT FACE – I don't care.
SAD FACE – I don't like it.

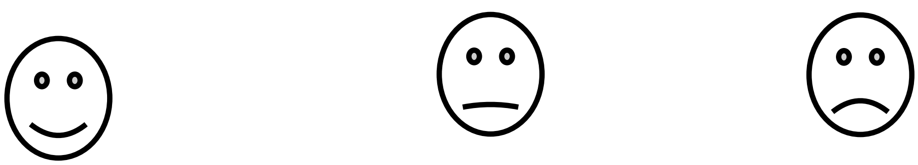
1. How do you feel about reading?



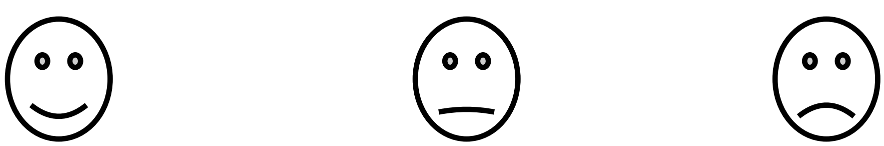
2. Do you like it when your parents or teacher reads to you?



3. How do you feel about reading/looking at books during your free time?



4. How would you feel about getting a book for a present?

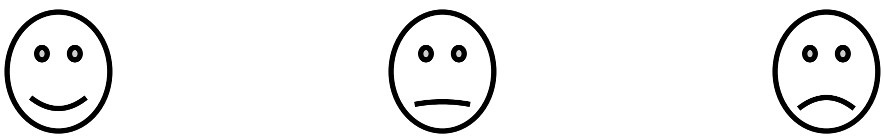


STUDENT SURVEY
Post-research Analysis

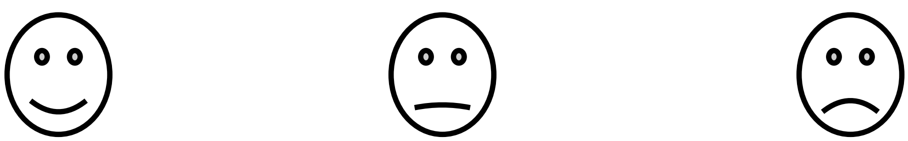
Please read the question to your child and circle the "face" which best describes your child's response. ***Thank you for your time!***

SMILEY FACE – I like it.
STRAIGHT FACE – I don't care.
SAD FACE – I don't like it.

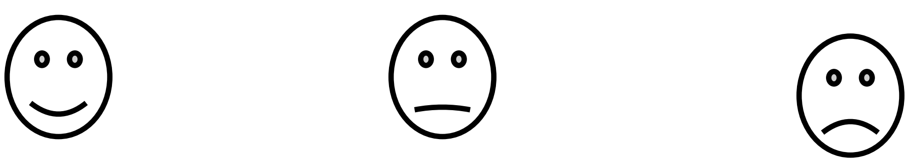
1. **How do you feel about reading?**



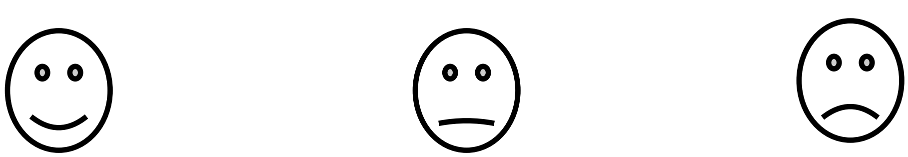
2. Do you like it when your parents or teacher reads to you?



3.How do you feel about reading/looking at books during your free time?



4. How would you feel about getting a book for a present?



Technology in the Spanish Classroom

Micah Gentry

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-108.

Introduction to the Problem

This project arises from the changing face of education in a nation where the name of the educational game is individualized instruction. Present-day students are more diverse in their learning styles, strengths, and weaknesses. Individualizing instruction for all learners has been combated through the use of technology, which provides a multifaceted source of instruction which allows both audio and visual learners to have their needs addressed simultaneously. This has been considered a possible solution for bridging the gap between Title I schools and more affluent schools.

Technology is used heavily in foreign countries where learning English is paramount in determining the success of an individual and their adaptability into the growing global economy. That need for Spanish as a necessary second language is growing in the United States. The dynamics of the Spanish population growth and education exist, but without real solutions for sufficient preparation; presently, there is little emphasis within the Spanish classroom to utilize all resources to reach and improve present Spanish instruction. Uncovering, first-hand, the strengths and weaknesses of technology, or determining in which role technology provides the greatest benefit, is of great value to any Spanish teacher.

Review of Literature

Technology has become the way of the future for today’s society in supplying the population with many modern conveniences within the home and workplace. In the last decade, there has been a strong push toward using technology to educate students. This sprung from the idea that technology can help anything, and public education needs help. The desire for immediate results showed no results for improving education through its collaboration with technology. Technology, in the foreign language classroom, has been used in foreign countries, and has proven to be effective for systems much different than that in the United States. Long-term research holds the answer to whether or not there is potential for improving foreign language classrooms in the United States. By observing historical patterns of students needs, one can see a pattern where, one day, technology will not just be a possibility in the classroom, but a requirement.

Historically, the creation of foreign language methodologies has been in response to the growing needs of the learner during a certain time period, or an attempt to improve upon existing methodologies. For hundreds of years, the Grammar Translation method, otherwise known as the Classical Method, stood alone as the most widely used methodology for its function of translating classical texts. Teaching using this method focused on rules, memorization, and paper-based translation assignments. This method of second-language acquisition was slow, and was not effective in teaching communication. The Audio-Lingual method became the dominant methodology during WWI, when the United States began to dispatch soldiers to all areas of the world, in efforts to build bases and establish relationships. The Audio-Lingual method focuses on learning dialogue and introducing words in a set pattern learned in a dialogue. This method proved to be the fastest method, at the time, and, obviously, faster and more effective in developing communication skills than the Classical Method (McDonough, 2001).

The introduction of Audio-Lingual activities brought about the return of the Direct Method, which attempted to replace the Classical method in the 19th Century. While it would not succeed in overcoming the new Audio-Lingual Method, it would show educators that they had options in varying their curriculum in the foreign language classroom. Since then, there have been a number of new methodologies that varied slightly from the originals, and some which provided completely new ideas of education. Methodologies, such as the Silent Way and

Suggestopedia, are not timeless, and can only be effectively used with very particular needs of students and teachers. The transition of methodologies has always existed to answer the needs of society. Today's demand for learners is a level of computer literacy and academic preparation for a high-tech society. Foreign language education needs to answer that need to prepare students for a high-tech world. The integration of technology into the foreign language classroom could be the solution to updating foreign language methodology, appropriate to today's learners (McDonough, 2001).

The biggest issue facing widespread technology integration into the foreign language classroom is the lack of long-term research showing the benefits of the collaboration of education and technology. The introduction of computer technology into education has not existed long enough in the non computer classroom to show a consistency of benefits. Any benefits from such a collaboration are just now being seen in preliminary results of studies concentrating on the use of synchronous and asynchronous activities. In 1998, the Education Rate (E-rate) subsidy program took effect; it was made part of the overhaul of the Telecommunications Act of 1996 (Goolsbee & Guryan, 2006). This subsidy program was the most ambitious federal school technology program in history (Goolsbee & Guryan, 2006). The state of California served as the ideal candidate for such research since comprehensive records of school computers and Internet access before the E-rate initiative had been kept (Goolsbee & Guryan, 2006). The preliminary results showed that the effort helped to narrow the digital divide among schools, but failed to produce immediate results on measured student outcomes (Goolsbee & Guryan, 2006). The results were preliminary, and attributed to being reported before adjustments could be properly made within the schools. Activists for Internet technology believe the lag time between implementation was too short to demonstrate the true effect.

Activists behind the E-rate believe that the long-term effects will show the benefits of technology in the classroom.

Today's global economy has forced other countries to teach the English language at the earliest stages of education. This is done to provide students with opportunities outside of their country, or within industries that operate globally, as more and more businesses are doing everyday (Beckett & Haley, 2000). While those countries have superior foreign language programs to meet the growing needs of the world economy, there is also a lot to be learned from the effective techniques being used. In a recent study evaluating 22 educators from 19 countries, the findings synthesized what the United States can learn from other countries in attempts to improve their own foreign language programs (Pufahl, Rhodes, & Christian, 2001). Among that list of recommendations were two distinct ideas: the proper integration of technology into education, and long-term research to evaluate the most effective practices within foreign language classrooms.

The actual use of technology within the foreign language classroom can be seen on several levels, and can be tailored to school budgets. Through studies examining the benefits of synchronous and asynchronous activities, they have proven to be worthy in improving the curriculum and utilizing technology (Altun, 2005). A synchronous activity, such as chatting online, provides a great opportunity for students to practice writing and structure, while forming communication skills. An asynchronous activity, such as the use of message boards, allows students to practice communication while not facing the pressure of answering right away. This gives students time to focus on grammar and respond correctly. Those activities utilize Internet technologies which, at times, might not be appropriate for all levels of students. Technology's integration into the classroom can be diverse, as well as flexible, in accommodating various grade levels. Uses include presentation of lessons, additional practice through software, and quicker access to authentic materials for educators.

Data Collection and Results

Data Collection

Methodology

Pre-test of Spanish skills (see Appendix A).

Post-test of Spanish skills (see Appendix A).

Field observations.

Recruitment and Selection Plan

Subjects are Spanish I students from an urban, magnet high school. This project will examine the differences between test performance, as well as classroom interactions and dynamics, over the course of 2 weeks. All students will act as participants, but only students that complete the necessary human subjects forms will be included in the analysis of the data.

Instructional Plan and Leadership

Students will be divided into two groups; one group will receive all instruction with the aid of technology, while the other group will receive only direct instruction without any use of technology. Technology will take the form of videos, music, PowerPoint presentations, and Internet tools geared toward Spanish education. The group without technology will receive lessons through direct instruction and other proven instructional strategies normally used within the Spanish classroom.

Time Commitments

Three classes of Spanish I students will receive the previously mentioned differentiated instruction for 10 consecutive school days for the entire class period, which results in 12 hours of contact time per class.

Results

The group with technology had a mean of 54% on the pre-test and a mean of 80% for the post-test. The group that received lessons without the integration of technology had a mean of 22% on the pre-test and 60% on the post-test. The greater gains were made in the group learning without technology, but the students had more room to improve, given the low mean for the pre-test. Field observations were compiled daily to record the reactions of the students to the use of technology. The students were consistently more excited about the lessons that used technology than with the lessons that did not use them, as those classes resembled the traditional classroom setting and environment. Field observations show that the technology-only group began to lose interest in the dynamics and interactivity that technology brought to the lessons after 4 days, and, at times, the students asked for a change, such as book work. Students from both groups were identical in their interest and motivation toward the lessons after 7 days of teaching. Despite the differences in daily videos, PowerPoint presentations, and music, the students seemed interested in something else/new.

Conclusions and Recommendations

Conclusions

Technology works within the Spanish classroom. With moderation being important in maximizing the balance between education and entertainment, it can be a great addition. PowerPoint presentations worked best because students could relate to the format, and appreciated the time and effort put forth by the educator to bring together a quality presentation.

Videos and music appealed less to the students, due to the general nature that they offered for a lesson.

It became apparent, at times, through field observations, that, in the class that was not utilizing technology, there could have been benefits from the integration of technology to change the pace and moral of the students, who were accustomed to a traditional Spanish instruction. The students without technology followed a traditional regimen and completed more traditional assignments, which had a major benefit. They were, perhaps, more accustomed to doing those types of activities which prepared them more for the post-test. Had the post-test taken place using a medium of the technology, then, perhaps, the results could have, once again, been different. The use of pre-test and post-test methods to gather data should have been coupled with a survey, as well, to measure the student's personal interest in preferred presentational methods, as well as what is most helpful to them.

The pre-test and post-test results do not convey what was viewed through daily field observations and interactions with the students. The means of the two groups can be easily identified as higher- and lower-performing students, as well, thus skewing the true measurement of what is/can be learned in the span of 10 days. Through research that shows great strides being made through the use of technology in other countries, there is real promise from using technology in education, whether in practice or presentation. Further studies will be needed to truly examine the most efficient and effective use of technology within the foreign language classroom.

Recommendations

I feel that this case study is a glimpse at the effectiveness of technology within the classroom, but a more specific case study over a much longer span of time can provide insight for educators, and should be supported. A closer look into methods and strategies used by other countries can be valuable in establishing strong educational practices here. A push for an increase in funding in the area of technology, as well as technology education for teachers, is important to meet the needs of society. Through teacher education programs, the use of technology within the classroom should be something the educator is already comfortable with using.

References

Altun, A. (2005). Toward an effective integration of technology: Message boards for strengthening communication [Electronic version]. *The Turkish Online Journal of Educational Technology, 4*(1), 1-8. Retrieved from Education Full Text.

Beckett, C. E., & Haley, P. K. (2000). Using standards to integrate academic language into ESL fluency [Electronic version]. *The Clearing House*, *74*(2), 102-104. Retrieved from Wilson Web (0030603859013).

Goolsbee, A., & Guryan, J. (2006, Winter). World wide wonder? *Education Next, 6*(1), p.60-65.

McDonough, S. K. (2001). Foreign language education: Responding to modern learners [Electronic version]. *The Clearing House*, *74*(6), 293-295.

Pufahl, I., Rhodes, N. C., & Christian, D. (2001). *What we can learn from foreign language teaching in other countries* [Electronic version]. (ERIC Document Reproduction Service No. ED456671)

Other Literature Consulted

Adams, M., & Jones, K. M. (2006). Unmasking the myths of structured English immersion [Electronic version]. *Radical Teacher, 75*(Spring), 16-21. Retrieved from Wilson Web (0610501008005).

Bartolome, L. I., & Leistyna, P. (2006). Naming and interrogating our English -only legacy [Electronic version]. *Radical Teacher*, *75*, 2-9. Retrieved from Wilson Web (0610501008003).

Bohlin, R. M., & Bohlin, C. F. (2002, March/April). Computer-related effects among Latino students: Educational implications. *Tech Trends, 46*(2), 29-31.

Cummins, J. (2006). Multiliteracies and equity: How do Canadian schools measure up? [Electronic version] *Canadian Education Association*, *46*(2), 4-7. Retrieved from Wilson Web (0610503475002).

Evans, C. (2006, September). Becoming a reflective technology teacher. *The Technology Teacher, 66*(1), 28-30.

Mainwaring, T., & Bergman, D. (2006, July). South Carolina: Tech-savvy teachers. *T.H.E. Journal*, *33*(12), 37-40.

Appendix A

Code__________________________________Clase____________Fecha_______

Los sustantivos

1	____	la sala de clase	A.	piece of chalk
2	____	el profesor	B.	grade
3	____	la leccion	C.	points
4	____	el examen	D.	high school
5	____	los apuntos	E.	notepad
6	____	el libro	F.	notebook
7	____	el cuaderno	G.	trumpet
8	____	la musica	H.	car
	____	la tarea	I.	book
10	____	la cinta	J.	teacher
11	____	la pizarra	K.	store
12	____	la nota	L.	bus
13	____	la biblioteca	M.	library
14	____	el coche	N.	exam
15	____	la cocina	O.	lesson
16	____	el autobus	P.	tape cassette
17	____	la tienda	Q.	homework
18	____	la trompeta	R.	kitchen
19	____	la tiza	S.	music

20____	el colegio	T.	tape

Los Verbos

1 ____	llevar	A.	to watch
2 ____	estudiar	B.	to return
3 ____	entrar	C.	to teach
4 ____	hablar	D	to need
5 ____	mirar	E.	to study
6 ____	tomar	F.	to enter
7 ____	sacar	G.	to play
8 ____	ensenar	H.	to speak
____	necesitar	I.	to carry
10____	regresar	J.	to take out

Los Interrogativos

1 ____	cual	A.	why?
2 ____	cuando	B.	how many?
3 ____	cuanto	C.	How much?
4 ____	donde	D.	Where?
5 ____	como	E.	How?
6 ____	por que	F.	What?
7 ____	que	G.	Which?
8 ____	quien	H.	Who?

Los adjectivos

1 ____	Corto	A.	good
2 ____	Malo	B.	private
3 ____	Bueno	C.	public
4 ____	publico	D.	fun
5 ____	privada	E.	positive
6 ____	dificil	F.	marvelous
7 ____	facil	G.	negative
8 ____	marvelloso	H.	dificult
____	divertido	I.	easy
10____	macanudo	J.	bad
11____	negativo	K.	awesome
12____	positivo	L.	Short

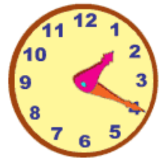
El tiempo

1. ____Es la una y viente

A. 

2. ____Son las nueve y media

B 

3. ____Son las seis menos cuarto C. 

4. ____Son las seis y media D. 

5. ____Son las seis y media E. 

Can Ability Grouping Benefit Students in the Middle School Math Classroom?

Kay S. Goodgame

EDUC 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-105.

Introduction to the Problem

Can ability grouping help or hinder middle school math students? My current school does not ability group in math. The school only offers “gifted reading” for all grades. There have been some small opportunities, in the past, for students to compact a math class and move to the next grade level. However, all math classes have focused on heterogeneous groupings. There are no classes based on ability. The incoming sixth graders come from ability-grouped math classes from our local feeder schools.

The school administration and teachers are concerned that our “gifted” or higher learners have been left behind in heterogeneous math classes, and are not pushed to their level of learning. This concern stems from a review of the value added scores by the administration. The school scores have shown a decline in the advance of our brightest math students. With this in mind, can ability grouping be incorporated into the math classroom to the benefit of higher learners and still benefit all learners?

Review of Literature

In a recent article on NCLB reform, the author quoted “the cruel irony of NCLB is that high-achieving kids are often overlooked as schools nation-wide focus on raising the scores of the middle” (Ramirez, 2007, p. 47). This article, and the school-wide push to challenge even our advanced students, led me to ask myself several questions. As a teacher, am I doing a disservice to these students by not offering an advanced class? Can I challenge my advanced students by implementing ability grouping within the classroom? Could my middle and lower students benefit from ability grouping? Or, would a combination of ability and heterogeneous grouping benefit all my students?

What is ability grouping? Bainbridge (2005, p. 25) defines it as, “the placement of children in one classroom into groups based on their ability.” The classroom may contain children with a wide range of abilities. Children can move in and out of groups, as needed. Greenfield (2000, p. 2) used ability grouping in his middle school math classroom, and found advantages, along with disadvantages, to this practice. He felt the advantages outweighed all disadvantages, and approved the use of ability groupings in his own school. Greenfield observed, however, that the ability grouping was not best used in the elementary setting, but in the secondary school setting. Larry Daniel’s summary (2007) validated arguments for both sides of the ability grouping argument. Some advantages his research found were:

- The curriculum can be adjusted to the students’ aptitude.
- Students can work at a faster or slower pace without getting discouraged in class.
- Students will like school subjects when studying with peers of similar ability.

Harlen and Malcolm (1997, p. 3) argue that the disadvantages outweigh the advantages by:

- Fostering lower self-esteem.
- Widening the gap between low and high achievers.
- Lower groups may label themselves and feel “locked-in.”

A common theme in the studies I have reviewed is, “what goes on in the classroom seems likely to have more impact on achievement than how pupils are grouped” (Harlen, 1997). This seems common sense to me. If a child feels safe in his or her classroom environment, then the chance that this child will learn is certainly attainable. But, if I can offer this safe environment, then can I still use ability grouping intermittently to the advantage of my students? It is not my intention to teach only the high learners in math. My concern is teaching and challenging all children, however, I feel the gifted are underserved. Wheelock (1992) felt the gifted need only a rich and varied curriculum to achieve their potentials. But, doesn't every child deserve such a curriculum? How and when should a teacher use ability grouping? Crosby and Owens (1993, p. 2) found the maximum benefit to ability grouping is to focus only on one or two subjects. In fact, Ireson, Hallam, and Mortimore (1999) found the greatest success in ability grouping is in the math classroom, in the studied secondary schools. Ability-grouped students in math are allowed to participate in mixed groups the rest of the school day. This schedule avoids the pitfalls of tracking. It is no surprise that the parents of high achievers support ability grouping as an important link to the students' success. With this research in mind, I used my own math students to test the benefits of ability grouping against heterogeneous grouping.

Data Collection and Results

Data Collection

Subjects

I have three separate math classes of mixed learning levels, with a total of 50 students. These students are sixth graders and attend a local county middle school. I am using my three math classes to establish different groupings, based on ability and heterogeneous groupings. I used two of my math classes as my experimental groups in which I incorporated ability groups for class work assignments. The third class was only grouped into heterogeneous groupings with mixed ability.

Materials

My materials for this project are the *Glencoe Course 1* math textbook, math manipulatives, PowerPoint presentations, and white boards. I gathered two different classroom activities to reinforce the lessons of identifying angles and measurement of angles in the geometry unit. I also pre- and post-assessed the students on this geometry unit.

Procedure

I pre-assessed all of my math students prior to the introduction of this geometry unit. I used a combination of pre-assessment, prior assessments, prior work current class grades, prior Think Link scores, and TCAP scores to arrange two classes of my students by ability groups. Typically, my students are in mixed-level groups that are reassigned every 3 weeks. I established ability groups on block days during the week. Each class was separated into four to five groups, based on ability. Each group was assigned class work based on the prior geometry lesson completed. My third class also completed the same pre-assessments, post-assessments, and class work assignments. This class was grouped into heterogeneous, mixed groups. I concluded the project with a post-assessment.

Timeline

The timeline for this research project was 4 weeks. My obstacles to this task were student absences due to illnesses (flu). I safeguarded my participants by not labeling their groupings.

Results

The results of my data are graphed into comparisons of the four given assignments in each of the three classes. I was surprised to see that there is no distinct visual difference in the graphs from the classes that were ability grouped to the class that was not ability grouped. Each class demonstrated an increase in their knowledge of the geometry unit from the pre-assessment to the post-assessment. The third period math class had the greatest score increase in the assignments, as presented in Figures 1, 2, and 3.

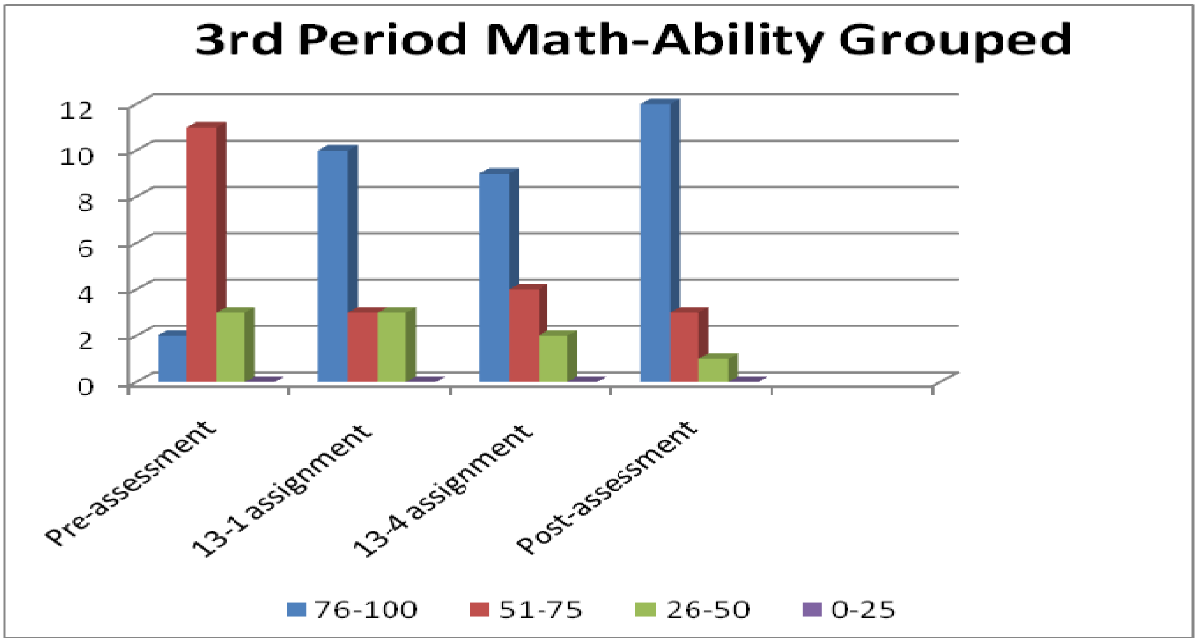


Figure 1. Third period math: ability-grouped.

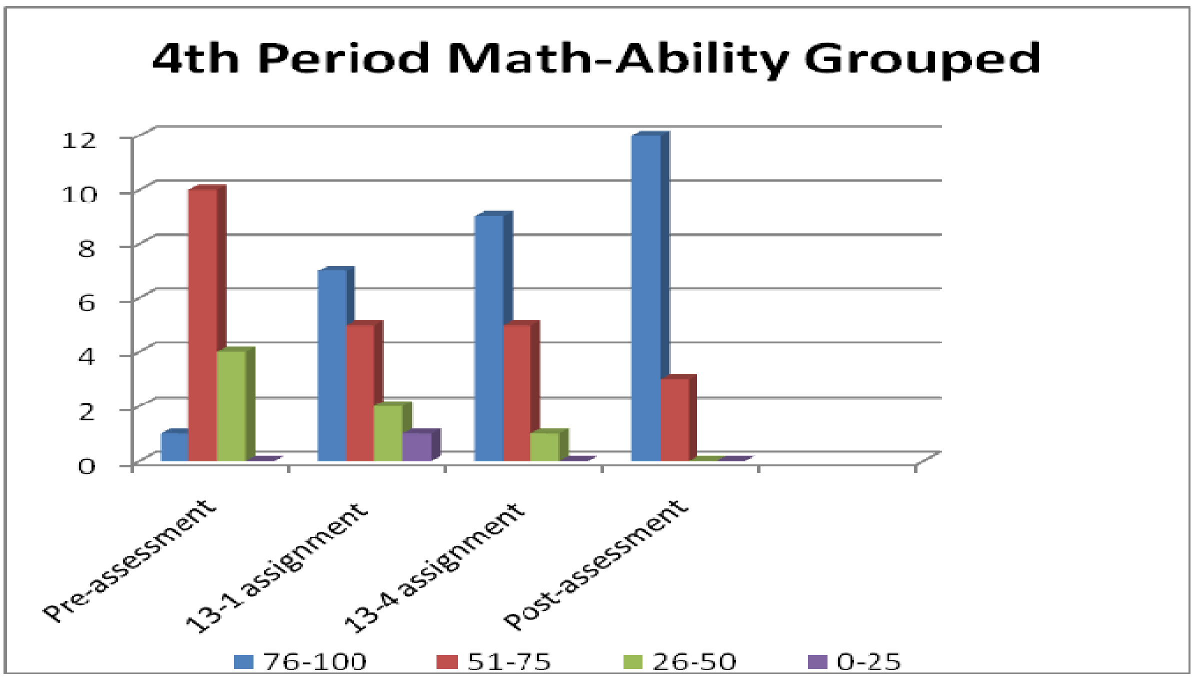


Figure 2. Fourth period math: ability-grouped.

My observation of the groups at work was that the higher learners did enjoy working with their peers in ability settings. However, my lower learners needed the guidance or assistance from those higher learners in mixed groupings. The students worked well with variety of groupings. My sixth period class was set in various mixed-level groups. I have extremely high to extremely low learners in that class. As shown in Figure 3, there is no real difference in experimental group scores from this control group of students.

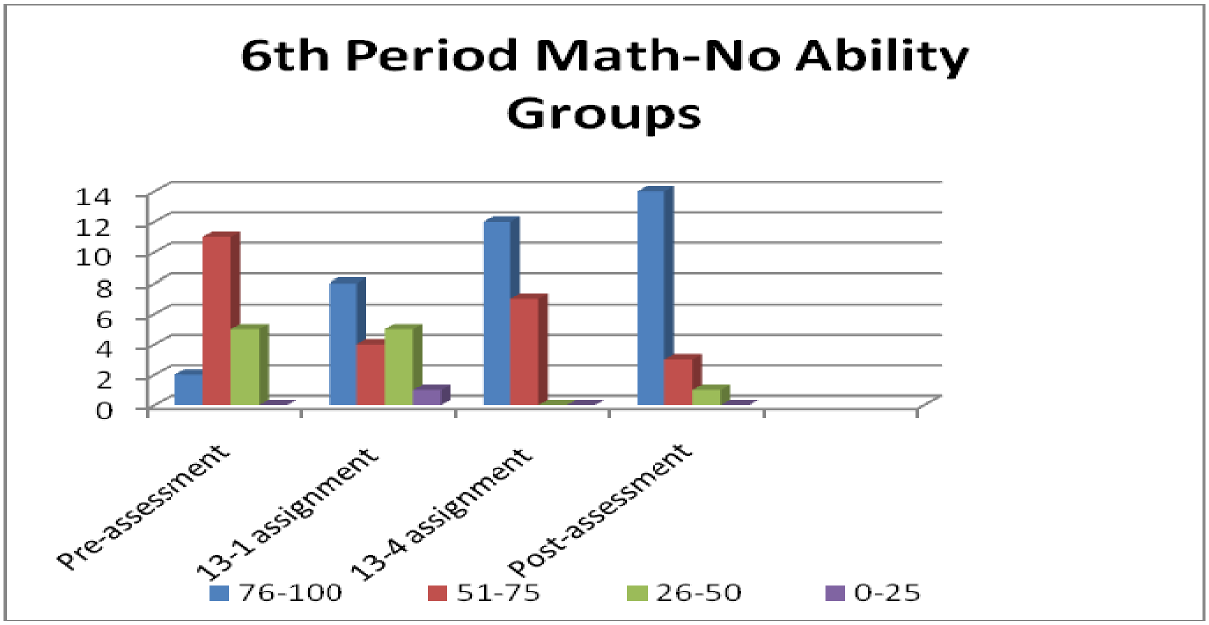


Figure 3. Sixth period math: no ability groups.

The mean of the pre-assessment for the third and fourth period classes averaged 60% with the sixth period class mean at a lower 55%. After the ability groups were in place in the project, the mean of the post-assessment for third and fourth period averaged 82%. The sixth period class mean was 80%.

Conclusions and Recommendations

Conclusions

My goal for this action research project was two-fold. I hoped to incorporate ability grouping to challenge my high-end learners and introduce assignments that require higher-level thinking skills. The use of ability groupings did seem to challenge and engage my higher-level learners. They enjoyed the competition among their peers. The majority of these students came from the two local, feeder elementary schools which ability grouped the math classes from third grade through fifth grade. These more advanced students were used to ability-grouped classrooms. My other levels of learners seemed to benefit more from a combination of direct instruction, mixed grouping, and ability grouping.

Recommendations

Based on my research, there is a place for ability grouping in the middle school classroom. It is obviously not the only method that can be used in grouping students. I would recommend to my administration that ability grouping be considered, but not be the only strategy for teaching. It can be incorporated as one of many ways to differentiate the classroom. There is a strong consensus among the other math teachers in the supporting elementary schools and my middle school that we should separate the students by ability to form the classes. I can see that this would benefit the gifted or higher learners. However, I am concerned that other levels of learners might be left behind in the process.

We do not have grant money available to further study and incorporate ability grouping into our school. Our parental support for grouping comes primarily from those parents of our higher learners, which is no surprise. To my knowledge, there are a limited number of schools in our district that ability group the math classrooms. It is not required, or fully supported, by the county system. Therefore, the administration does not have additional pressure to implement full ability grouping. I would recommend that our school research the use of ability grouping by speaking to other systems that incorporate its use. The investigation should look for the pros and cons of the topic. I would recommend that our school invite speakers for each side of the argument in ability grouping. Discussions with other schools that apply ability grouping can be created. It would also be interesting to speak with teachers from schools who applied ability grouping, but then removed it from the math classroom. There is, indeed, a need for more research and study on this subject to make a fully-informed decision as a department, school, and county system.

If ability grouping becomes a part of our program, then technology can offer a way to stretch independent study for our students. Not only can technology help a teacher create differentiated projects for the students, but added computers, programs, and software would only expand the level a project could be taken to by the student.

A combination of different groupings, partnerships, and direct instruction will reach all levels of learners. Ability grouping is just one way to differentiate the math classroom. I do not think there is only one way to group middle school math students. Every child is a unique learner. If ability grouping were the only choice, then it is obvious that many students might not be pushed to their potential. However, ability grouping can be incorporated as a stimulus and an occasional tool to enhance the knowledge of the higher learner.

References

Bainbridge, C. (2005). *Your guide to gifted children*. Retrieved April 16, 2008, from http://www.giftedkids.about.com/

Crosby, M. S., & Owens, E. M. (1993, March). *The disadvantages of tracking and ability grouping: A look at cooperative learning as an alternative.* Solutions and Strategies Series, National Dropout Prevention Center, Clemson, SC.

Daniel, L. (2007). *Heterogeneous grouping: Research summary*. University of North Florida.

Greenfield, S. (2000). *The advantages and disadvantages of ability grouping,* Lincoln, NE: 800 Summaries.

Harlen, W., & Malcolm, H. (1997). *Setting and wtreaming: A research review.* The Scottish Council for Research in Education.

Ireson, J., Hallam, S., & Mortimore, P. (1999). *Ability grouping in the secondary school: The effects on academic achievement and pupil's self-esteem.* University of Sussex at Brighton, England: British Educational Research Association Annual Conference.

Ramirez, E. (2007, November 12). Room to improve. *U.S. News & World Report*.

Wheelock, A. (1992). *Does ability grouping help or hurt?* New York, NY: New Press.

What Motivates Elementary Students to do Math? An 8-week Study on How Third-grade Students at an Elementary School React to Math Games versus Assignments

Briana Howard

Education 590, Spring 2008

The University of Chattanooga at Tennessee

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-095.

Introduction to the Problem

When comparing our children's standardized test scores in math and science to those of children in other countries, like Japan, results have shown that, on average, our students rank lower (Hirsch, 2006). In addition to lower-ability levels, our students, generally, have more negative opinions about the subject. This is a serious issue that our nation has already been trying to address, and one that all educators should keep in mind. The potential consequences of our nation's children falling behind in such critical areas could be dire. That is why this problem is the focus of this study.

Review of Literature

A good deal of research has been done on factors that affect math achievement in students. One study looked at the achievement motivators in math for students from the United States, Canada, and Norway. Comparatively, the data showed that the biggest indicator of achievement for American students is linked to their parents' highest level of education, while, in Canada and Norway, it is mainly predicted by the students' level of confidence. Other influencing factors of achievement are students' attitudes and backgrounds, the curriculum and instruction, home environments, peer influence, teachers' practices, and socioeconomic status (Mullis & Stemler, cited in Ercikan, McCreith, & Lapointe, 2005).

Another study used comparative data on students, from Taiwan and America, in order to gain some insight into why American students consistently rank low in math and science when compared to nations like China, whose students consistently rank high. They looked at the difference in the two groups' perceptions about math, and noted considerable differences. The American students had a very negative attitude toward math, while the Taiwanese children were very positive, and placed a very high value on mathematics education. In addition, the

Taiwanese, like other Asian cultures, place a much greater emphasis on hard work, rather than on natural ability, as in the United States. Here it is more about a person's IQ, but, in Taiwan, a person who perseveres will have greater success (Tsao, 2004).

With regard to teaching strategies that motivate children to advance their academic achievement, research has been published on game theory and grade theory. A consistency of agreements has been made that children can learn a lot by playing games, particularly group games. Both younger and older kids can benefit from them because they actively engage their minds, and give the children something better with which to relate, so that they might actually hand on the knowledge (Hannafin & McDonald, 2003). Other studies have shown that games are a huge success because the students have fun, and, by doing so, they are more motivated to do their work, and feel a greater sense of confidence in their ability (Reys & Wasman, 1998; Butler, Land, Ndahi, & Williamson, 2004). A recommendation seen in a couple of the studies said that children will learn more if they are given the freedom to choose, invent, and modify their own games. This allows the children to utilize the knowledge that they have, and strengthens the foundation for new knowledge (Hildebrandt, 1998; Dixit, 2005).

Research on grade theory has had mixed results. One study looked at the students' perceptions about grades, and how they related to their academic achievement. It found that some children thought of grades as a way to show what they had learned, but most children connected them with gaining the approval of adults (Xu, 2005). This indicates that they are not learning for the sake of becoming more knowledgeable, but are just memorizing facts to please their teachers and guardians. Therefore, the knowledge that they retain will most likely be short-lived.

Data Collection and Results

Participants

The participants in this study will include the 16, third-grade students who are in the classroom where I am assigned for student teaching. It is an inclusion class, so some of the students have disabilities and function at varying levels. The students will complete surveys, pre-tests, and post-tests. They will also participate in math games. The cooperating teacher will participate in informal interviews.

Instruments

Triangulation of qualitative and quantitative data will be accomplished through field notes from informal interviews with the cooperating teacher, active participant observations with the students during regular math lessons and game lessons, pre- and post-surveys of the students' attitudes about math (see Appendices A and B), and pre- and post-tests (see Appendix C) reflecting third-grade probability standards.

Data Collection

On the first day of the 8-week study, research began with an informal interview of the cooperating teacher about what she had covered in math class and what her students' different ability levels were. The project was discussed and the teacher fulfilled requests for the third-grade curriculum standards and state performance indicators, and the math texts being used, *Everyday Mathematics*.

The first week was spent getting students to return parental consent and student assent forms, and observing the cooperating teacher and students in all subjects, paying particularly close attention to the teacher's methods of instruction and the students' attitudes and work ethic/output during their 1-hour daily math lesson from 11:00 a.m. - 12:00 p.m. Notes were taken on these observations. During the second week, after all 16 students had returned their parental consent and student assent forms, the pre-survey and pre-test were administered. Then, lessons on probability were begun, and continued for the next 2 weeks. Direct teaching was used for each of the eight, *Everyday Mathematics* lessons on probability, along with some hands-on guided practice, and independent work. Direct participant observations were made during this time of the students' attitudes and work ethic/output. Notes were consistently recorded on the day's events.

After all of the eight probability lessons were taught, the post-test was given. This was the exact same test the students took before probability lessons were started. A major event occurred here that would affect the internal validity of the pre- and post-test. The cooperating teacher, unbeknownst to the researcher, announced to the students that she was counting this as an actual test grade. The dependent variable was significantly influenced. During the following week, math games pertaining to each of the probability lessons were taught and played. This included games played indoors and games played outdoors. Direct participant observations were done during this time, and notes were taken. At the conclusion of game week, the post-test was given for the third time, and a post-survey, differing from the pre-survey, was completed by each student.

After data collection was completed, data were analyzed and interpreted, and conclusions were drawn. First, it was read several times to check accuracy. Then, it was organized into themes and questions. Interpretations were made, to the best of my ability, based on my experiences, and by looking at the causes and effects. In order to support my conclusions, other teachers were consulted for their opinion of math games, and then I reviewed the literature I had collected on the topic. Findings were linked to established theory, and the data's value was assessed.

Data Analysis

Qualitative Data

Nonparticipant observations. The non-participant observations of this classroom showed that the teacher has stressed mathematics instruction with her students. The students receive multiple exposures daily, for example, morning word problems, mid-day timed tests for speed, almost daily math quizzes and tests, *Accelerated Math* (diagnostic tests), Mountain Math, "math boxes," and other pages from the students' *Everyday Mathematics* journals. Her emphasis on math appears to have broken that wall of dislike that many students seem to build up in their heads to keep math out. Also, many of the activities are leveled so all learners are working at an appropriate level. The students are engaged during timed tests and *Accelerated Math,* and there is a sense of competition in the air that seems to drive many of them. Comparing these observations to the key research question of what motivates elementary students to do math, in this case, it looks like competition to be faster and score better.

Direct-participant observations. The direct-participant observations were, in my opinion, the most telling and reliable form of data collected. Starting with the first probability lesson I taught, the students were using probability vocabulary: *certain, uncertain, more likely, less likely, equally likely, impossible, possible,* and *certain*. After covering the meaning of each term, I went around the room with a candy can (which cannot be seen through) that had eight pieces of blue raspberry taffy and eight pieces of red cinnamon taffy, and I had each student describe their chances, using our probability terminology, of getting the kind of taffy they wanted. One student kept a tally chart of the number of reds and blues on the board while I went around the room with the jar. The students really enjoyed this activity; everyone was smiling and participating with enthusiasm. Afterwards, we went over the student's math boxes, a math homework assignment they receive daily. I pulled name sticks for students to go to the board to work each problem, just as their teacher does. The teacher was paying very close attention at this point, but many of the students seemed to lose focus during this. Bodies got droopier, eyes got tired, and I started getting questions of, “when is lunch?”

On the next day, we did a pattern-block toss experiment which had students working in groups, collecting, tabulating, and interpreting experimental data. The students were engaged, and, mostly, enjoying the activity. Some had to be refocused on the experiment. Afterwards, students went back to their seats, and we went over their math boxes. The same mood as the previous day was felt. It seems like some are paying attention, while others are not.

On day 3 of math, I began the lesson with checking over the math boxes. Students might have seemed a little more energetic, but not much. I had to refocus them a few times. When we finished with the math boxes, the students worked with a partner to do a coin-toss experiment. They recorded their data, and then we compiled a class data chart on the board and discussed *equally likely* events. The students did a good job working with their partners and stayed focused on the experiment. A couple of groups had difficulty understanding, and needed some re-teaching and guided practice.

On day 4 of math, we checked math boxes first. The same mood was prevalent. The students had difficulty with a couple of problems dealing with fractions. I explained, and showed how to work the problem on the board. Some eyes were on me, and some were not. Redirecting only gains the stragglers’ attention for a brief amount of time before it is lost again. Next, we did spinner experiments. The students collected and interpreted data from spinners with *equally likely* outcomes and *not equally likely* outcomes. Most of the students did the experiment without losing focus. A few had to be refocused and had to have guided practice. Next we discussed fractions. Many students had difficulty with this, but all seemed to be paying attention.

On day 5 of math, we checked math boxes. Students, again, had difficulty with the fraction problems and seemed bored. For the lesson, we designed spinners that represented the likelihood of outcomes. As a whole group, we made spinners representing various fractions. Then, I gave each student 12 jelly beans of various colors, and they had to make a spinner representing their jelly bean colors. All of the students were engaged and smiling during this. Very little guidance was needed; everyone got it.

On day 6, we did not have time to go over math boxes because of a schedule change. Once we got back into the classroom after the speaker left, we went straight to work on our math lesson. We made predictions based on experimental outcomes and constructed situations meeting given conditions. First, I explained the value of repeating experiments in order to make more reliable predictions. Then, they saw first-hand, evidence, by doing repeated drawings, recording the data, and guessing the colors of the five Easter eggs I had in my bag. Students were a bit restless, but most seemed to be paying attention and got it. Next, I gave each person an egg, and had them construct, as a class, the different situations I described, using our probability vocabulary. They were supposed to work together and hold up the proper colors to meet the situation I described. None of the students were able to do this. The class was too rambunctious and could not work together. Conflicts may have been due to an irregular morning schedule.

On day 7 of math, we covered 2 days of math boxes and moved to the lesson. Students organized their own survey, collected the data, analyzed the results, and made predictions. All of the students had a good time asking their survey questions, and enthusiastically participated. The last day was spent doing review with whiteboards and markers. Everyone participated as I asked review questions and had students write the answers on their whiteboards. Most of the class remained engaged for the full hour. Friday was assessment day in my class, so the cooperating teacher let me do my post-test. After I handed it out, though, she told them it was counting for a test grade. The validity of the pre- and post-tests had been affected.

For days 9 and 10, my cooperating teacher said I could do my math games, without covering math boxes! On day 9, we did only indoor games, and, on day 10, we did outdoor games. For the indoor games, we played “The Block-Drawing Game” and “Spinning to Win,” two probability games from *Everyday Mathematics*. I also had “Fraction Bingo,” and a math version of the game, “H-O-R-S-E,” that I called “C-H-A-N-C-E.” Instead of shooting baskets, students would answer probability questions, gaining a letter of the word chance each time their team missed a question. With only an hour for math class, however, we only completed the two *Everyday Mathematics* games. The students had fun with these. A couple groups required re-teaching of the rules and some guided practice, but everyone got enough time to play at least a few rounds of each. The students began by playing enthusiastically, but some did get bored.

On the last day, we played two outdoor games. The class was divided into two teams and voted on team names. Then, I explained the rules and we went outside and played. The first game was a probability relay, where each team member had a card with an event on it and each team member had to hop to the center of our play area and put his or her card into the appropriate bag, one of three labeled “equally likely,” “less likely,” and “more likely.” When the entire team had all cards in the bags and was seated on their line, I checked them and took out the cards that were misplaced. The team then had to stand up and keep playing until they had put all of their cards into the appropriate bags. The first team to have all of their cards in the correct bag, and have all team members seated back on their line, won the game. The students did a great job with this, and wanted to play again when it was over. There was not enough time, though, so we moved on to the next game, which was a math variation of "Steal the Bacon." The teams lined up horizontally, across from each other, while I stood in the middle with the "bacon," (an empty bottle) and read probability questions. Each student had an answer card and had to know the answer to my questions to be able to know when his or her card was called so he or she could race to the center to capture the bottle and take it back to his or her line before the opposing team member did or tagged him or her out before getting back to the line. The team with the most points (one point per captured bottle) at the end wins the game. This game was a little harder for the students. Many got it, but, those who did not, became frustrated, and teammates got into arguments. In spite of this, however, everyone still had a good time; some, I think, were just happy to be outside on a nice day.

Summary. Overall, the direct-participant observations showed that students were bored doing drill work and repetitive assignments, such as math boxes, but became enthusiastic when they got to do different activities, like hands-on experiments, working with groups, and playing games. The games were motivating to them, in that just the mention of playing games made them excited, but they had to have the necessary content knowledge and skills to be able to play. These findings were in agreement with the pre-survey data because many students mentioned not liking assignments, such as math boxes. They also stated, in the post-survey, that their favorite parts of the math lessons were the games (and candy), which was in agreement with all observations as evidenced by each student's difference in energy level during math boxes and games.

Pre-/post-research surveys

The pre-research survey asked students four questions that would lead to understanding the students' perceptions about math (negative or positive attitude), the value they place on math education, and the different activities that they do that make them like and dislike math or other subjects (see Appendix A). Eleven of the 16 students expressed positive feelings about math, 2 students expressed a definite dislike, 1 student expressed positive and negative feelings about it, and 2 students were confused by the question. The next question, about the value of math education, also showed more positive than negative feelings. Fourteen of the 16 students felt that math is the most important subject in school and 2 students felt that other subjects were more important. The third question, about classwork/homework that students dislike in school, revealed that all 16 students found drill work or repetitive assignments (such as math boxes, or writing spelling words 25 times each) objectionable, and a few students said they did not like anything that took a long time. The last question, which tried to ascertain what teaching strategies could be used to make lessons more interesting and motivate students, was not answered in a mature enough manner by most of the 16 students to be useful to the research.

The post-research survey was comprised of four questions that were directed at ascertaining each student's reaction to playing math games, versus their regular math class activities (see Appendix B). For the first question, 14 students said they most enjoyed the games we played or chose a specific game they liked best. One student was confused by the question and one student was absent. For question two, 12 students said they learned the most from the math games, and 2 students said they learned the most from the candy experiments we did. On question three, 14 of the 15 students said they remembered their math better after we played a game with it, and 1 student said math was learned better from assignments. For the fourth question, 13 of the 15 students said they would want to play more games in math class because they were fun; 1 student said he wanted to do more writing in math class, and 1 student was confused.

Quantitative Data

Pre-test results (see Appendix C).

	#1	#2	#3	#4	#5	#6	#7	#8	#9
S101	C	C	C	C	C	C	C	C	C
S102	C	C	C	C	X	X	C	C	C
S103	X	X	C	X	X	X	X	X	C
S105	X	C	C	C	X	C	X	C	X
S106	X	X	C	C	C	C	C	X	X
S107	X	X	C	C	C	C	C	X	C
S108	X	C	X	C	X	X	C	X	X
S110	X	X	X	X	X	C	C	X	X
S112	C	X	X	C	X	C	X	X	X
S113	X	X	C	C	C	X	X	X	X
S114	C	C	C	C	C	X	C	X	C
S115	C	X	C	C	C	C	C	C	C
S116	C	C	C	C	X	C	C	C	C
S117	C	X	X	C	C	X	X	X	C
S118	X	X	C	C	C	X	C	X	C
S119	X	X	C	C	X	C	C	X	X
Correct	7	6	12	14	8	9	11	5	9

Figure 1. Students' correct and incorrect responses on test 1. Key: C = answered correctly; X = answered incorrectly.

Post-test results.

	#1	#2	#3	#4	#5	#6	#7	#8	#9
S101	C	C	C	C	C	C	C	C	C
S102	C	C	C	C	C	C	C	C	C

S103	C	C	C	C	C	X	C	C	X
S105	C	C	C	C	X	C	C	X	X
S106	C	X	C	C	C	C	C	C	C
S107	C	C	C	C	C	C	C	C	C
S108	C	X	X	C	X	X	C	X	X
S110	C	X	C	C	X	C	C	C	X
S112	C	C	C	C	C	C	C	C	X
S113	C	C	X	C	C	C	C	X	X
S114	C	C	C	C	X	C	C	C	C
S115	C	C	C	C	X	C	C	C	C
S116	C	C	C	C	C	C	C	C	C
S117	X	C	C	C	C	C	C	C	C
S118	C	C	C	C	C	C	C	C	C
S119	C	C	C	C	C	C	C	C	C
Correct	15	13	14	16	11	14	16	13	10

Figure 2. Students’ correct and incorrect responses on test 2. Key: C = answered correctly; X= answered incorrectly.

Post-post-test results.

	#1	#2	#3	#4	#5	#6	#7	#8	#9
S101	X	X	C	C	C	C	C	C	C
S102	C	C	C	C	C	C	C	C	C
S103	A	A	A	A	A	A	A	A	A
S105	X	X	X	C	X	C	C	C	X
S106	X	X	C	C	C	C	C	C	X
S107	X	X	C	C	C	C	C	X	C
S108	C	X	C	C	X	C	X	X	C
S110	C	C	X	X	X	X	X	C	X
S112	X	X	C	C	X	X	C	X	X
S113	X	X	C	X	X	X	X	X	X
S114	X	X	C	C	X	C	C	C	C

S115	C	X	C	C	C	C	C	C	C
S116	C	C	C	C	X	C	C	C	C
S117	X	X	C	C	C	C	X	C	C
S118	C	X	C	C	C	C	C	C	C
S119	X	X	C	C	C	X	C	X	X
Correct	6	3	13	13	8	11	11	10	9

Figure 3. Students' correct and incorrect responses on test 3. Key: C = answered correctly; X = answered incorrectly.

Pre/post/post-test analyses

Pre-test:

- Minimum – 2.
- Maximum – 9.
- Range – 7.
- Median – 5.
- Mode - 3, 5.
- Mean - 5.1 or 56.3%.

Before teaching the probability lesson, the test showed that the number of correct student responses varied widely. Two students answered two questions correctly, three students answered three questions correctly, two students answered four questions correctly, three students got five questions right, one student got six questions correct, two students got seven answers right, two students got eight answers right, and one student got all nine test questions correct. The mode, or score that most students got, was three or five out of nine answers correct, or a 33.3% or a 55.6% test score. The class mean was 56.3%.

Post-test:

- Minimum – 3.

- Maximum – 9.
- Range – 6.
- Median – 7.
- Mode – 9.
- Mean - 7.6 or 85.0%.

After teaching the probability lesson, the test showed the variability in correct responses students made decreased. One student got three answers correct, three students got six answers correct, one student got seven answers correct, five students answered eight questions correctly, and six students answered all nine questions correctly. The mode on the post-test was a 9, or 100% correct. The class mean was 85.0%.

Post-post-test:

- Minimum – 1.
- Maximum – 9.
- Range – 8.
- Median – 6.
- Mode – 6.
- Mean - 5.6 or 58.3%.

After playing the probability games, the test showed the variability in correct responses students made increased from the second test. This shows how the validity of the tests was affected by the cooperating teacher telling students before they took the second test that she was giving them an actual test grade on it. Because this happened, the scores cannot be compared since the parameters were varied. However, the mean for test three was slightly higher than the mean for test one. An interesting observation can be made about the effect grades have on students' motivation, with this particular group of students. When they thought the test was just an activity to see how much they knew (tests one and three), they, obviously, did not try very hard on it. Most finished tests one and three very quickly, and the poor scores reflected the amount of effort they put into them. When the test was introduced by their teacher as counting for a test grade, every student appeared to be taking their time reading the questions and thinking about the correct responses. For test two, the students spent about twice as much time working on it than they did on tests one and three, and their high scores reflect their effort.

Pre-/post-test summary

Because the validity of the tests was affected, they cannot be compared in the manner that was planned. However, tests one and two can be compared to see how effective the teaching strategies were that I used for the probability chapter. Before any lessons on probability were taught, student test scores ranged greatly from very low to high. Some students may have had very little previous exposure to probability, while others had much more exposure. After the probability lessons were taught, the range in test scores significantly decreased, and almost the entire class scored above the test average. After comparing the pre-test and post-test scores, Figure 4 illustrates that the instructional methods used had a positive impact on the students' understanding of probability.

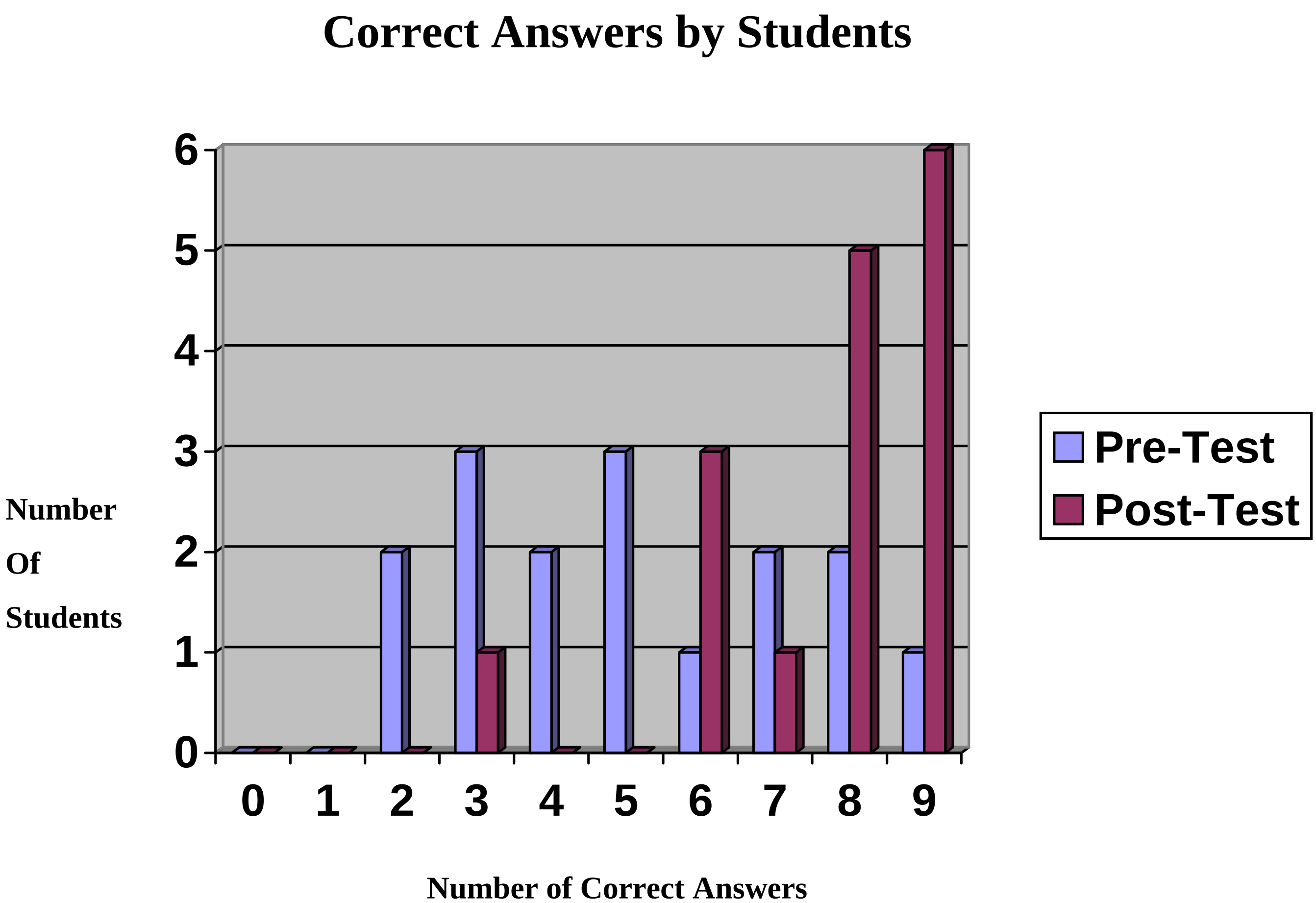


Figure 4. A comparison of the number of correct student responses on test 1 and test 2.

Conclusions and Recommendations

Conclusions

In conclusion, the results of the study showed that games are a great tool to use in the classroom, especially when used to reinforce the concepts being taught. Direct participant observations revealed that every student in the study was more enthusiastic about playing a math game than working on the usual math assignments. These findings are also in agreement with the National Council of Teachers of Mathematics (NCTM, 2008) feelings about using math games in the classroom. They offer some free games on-line. In addition to the NCTM backing the use of math games, the University of Chicago School Mathematics Project, the publisher of *Everyday Mathematics*, is also a strong advocate of using math games to reinforce the content. They have an entire book dedicated solely to math games that reinforce the curriculum standards.

Recommendations

From this research, I would recommend that all teachers use games in their classrooms to reinforce the standards they are teaching. They are a great way to mix-up your lessons, especially if you are "stuck in a rut" of workbook pages and assignments (like math boxes). They get students interested in what you are teaching and more enthusiastic about the content. Professional development opportunities on game ideas to use in the classroom would be very beneficial. There are many resources available to teachers for purchasing games or getting some free ideas on-line. The NCTM Web site has games for almost every standard, which can be downloaded for $49. There are many other educational associations that offer games or activities. Many textbook publishers, have game resources available, or included in the text packets. With children being so tech-savvy today, the teacher may want to purchase computer games that reinforce the math standards being taught. These are abundantly available online, and can be purchased from education retailers. Grants for further research on the effects of using math games in the classroom might be available through the Classroom-Based Research Grants or through the Engaging Students in Learning Mathematics Grants, accessible online through the NCTM Web site.

References

Butler, B., Land, L., Ndahi, H., & Williamson, K. (2004). A structured framework for using games to teach mathematics and science in K-12 classrooms. *The Technology Teacher, 64*(3), 15-18.

Dixit, A. (2005). Restoring fun to game theory. *The Journal of Economic Education*, *36*(3), 205-219.

Ercikan, K., McCreith, T., & Lapointe, V. (2005). Factors associated with mathematics achievement and participation in advanced mathematics courses: An examination of gender differences from an international perspective. *School Science and Mathematics, 105*(1), 5-14.

Hildebrandt, C. (1998). Developing mathematical understanding through invented games. *Teaching Children Mathematics*, *5*(3), 191-195.

National Council of Teachers of Mathematics. (2008). Retrieved April 15, 2008, from http://www.nctm.org/

Reys, B., & Wasman, D. (1998). Math is FUNctional! A math fair for kids. *Mathematics Teaching in the Middle School, 3*, 260-266.

Tsao, Y. (2004). A comparison of American and Taiwanese students: Their math perception. *Journal of Instructional Psychology, 31*(3), 206-213.

Xu, J. (2005). Purposes for doing homework reported by middle and high school students. *The Journal of Educational Research, 99*(1), 46-55.

Other Literature Consulted

Caldwell, M. (1998). Parents board games, and mathematical learning. *Teaching Children Mathematics*, *4*, 365-367.

Hannafin, R., & McDonald, K. (2003). Using web-based computer games to meet the demands of today's high-stakes testing: a mixed method inquiry. *Journal of Research on Technology in Education, 35*(4), 459-472.

Krantz, S. (2004). Decreasing math anxiety in college students. *College Student Journal, 38*(2), 321-324.

Patrick, H., & Turner, J. (2004). Motivational influences on student participation in classroom learning activities. *Teachers College Record, 106*(9), 1759-1785.

Appendix A

Student Survey
Pre-research Attitude Analysis

1) If you had to choose one, which subject would you say is more important in school, Language Arts or Math? Explain.

2) Which subject do you like better? Why?

3) For your least favorite subject, describe some of the activities you have done in class or at home to learn it.

4) If you got to be teacher-for-a-day, how would you make your least favorite subject more interesting?

Appendix B

Student Survey
Post-research Attitude Analysis

1) From the probability chapter, which activity did you enjoy the most?

2) Which activity did you learn the most from doing?

3) Did you remember your math better after we played a game with it or after you did a graded assignment with it?

4) What activity would you like to do more often in math class? Why?

Appendix C

3rd Grade Math: Probability

Pre-Test/Post-Test

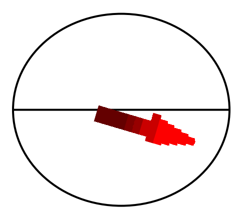
Directions: Circle the correct answer.

1. The bag contains 8 blue marbles and 2 white ones. You pull one marble out of the bag. Choose the *impossible* event.
   (a) The marble you pulled out is red.
   (b) The marble you pulled out is white.
   (c) The marble you pulled out is blue.

2. The bag contains 5 pennies and 4 quarters. You pull one coin out of the bag. Choose the *certain* event.
   (a) You pull out a penny.
   (b) You pull out a quarter.
   (c) You pull out a coin.

3. The bag contains 5 stars, 2 squares, and 3 triangles. You pull one shape out of the bag. Choose the *possible* event.
   (a) You pull out a rhombus.
   (b) You pull out a star.
   (c) You pull out a circle.

4. Look at the spinner and choose the event that is *most likely* to occur.*
   (a) You will spin red.
   (b) You will spin green.
   (c) You will spin yellow.



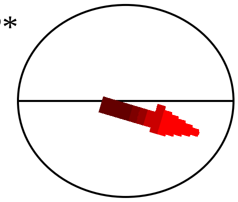
5. From the same spinner, choose the event that is *least likely* to occur.*
   (a) The spinner lands on red.
   (b) The spinner lands on a line.
   (c) The spinner lands on yellow.

6. Choose the two events that are *equally likely* to occur on the spinner.*
   (a) You will spin a red or yellow.
   (b) You will spin a green or red.
   (c) You will spin a green or yellow.

7. Select the answer with all the possible outcomes of tossing a penny one time.
   (a) You could get heads.
   (b) You could get heads or tails.
   (c) You could get tails.

8. What are all the possible outcomes of rolling a regular number die one time?
   (a) You roll a 1, 2, 3, 4, 5, or 6.
   (b) You roll a 2, 4, or 6.
   (c) You roll a 1, 2, 3, 4, 5, 6, or 7.

9. What are all the possible outcomes of flicking the spinner one time?*
   (a) You spin red, yellow, green, or orange.
   (b) You spin red.
   (c) You spin red, yellow, green, or blue.



*Note: on the actual student pre-/post-tests, the spinners were sectioned off appropriately.

Implementing Direct Instruction and the Use of Graphic Organizers in Small Groups to Improve Math Skills for Students at Risk of Academic Failure: An Action Research Project

Mary E. Jackson

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-107.

Introduction to the Problem

Rosenshine and Stevens (1986) define direction instruction (DI) as a teaching method that focuses on content and how that content is taught. DI is also defined as an explicit, intensive, teacher-directed instructional method (Sommers, 1991). DI is somewhat out of fashion, these days, in our classrooms and in teacher training institutions. An example of this disfavor is at teaching institutions in the state of Wisconsin; none of them offer classes teaching DI for regular education students (White, 2005). However, training is offered at the same institutions in cooperative learning and other constructivist methods. Tarver (1992) associates DI with positive student learning outcomes for students with learning disabilities (LD). Rosenshine and Stevens (1986) also analyzed effective instructional practices, and noted the importance of DI for helping learners perform independently on highly structured tasks, such as computational skills. More specifically, their primary findings state that DI is important when teaching processes in small steps and during guided student practice. Additionally, a third finding stated the DI is important in guided practice for LD students, to develop mastery and deep understanding of many mathematical concepts (Rosenshine & Stevens, 1986). Moreover, DI has been shown to be one of the few teaching methods used today that produces consistent results in improving student achievement (White, 2005).

Review of Literature

DI is a teacher-centered teaching methodology that many teachers use incorrectly (Arends, 2007). When used correctly, DI is a process teaching methodology which includes the following teaching functions: review (provide an advance organizer); presentation (provide teacher modeling, guided practice); corrections and feedback; independent practice; and generalization (summarization). Each of these steps is also listed among the best practices of effective teaching (Rosenshine & Stevens, 1986). Researchers have found these steps effective in math instruction of students with learning disabilities (Gagnon & Maccini, 2002). The use of DI with small groups of children with LD should prove to improve their math skills and overall confidence in problem solving.

DI Studies

Numerous studies have been conducted, and their results published, to document the most effective teaching techniques. Several of these studies highlight the effectiveness of DI versus constructivist approaches, which include discovery learning. One of the most notable studies was the 1996 DISTAR (Direct Instruction System for Teaching Arithmetic and Reading) study.

The DISTAR study was a follow-up study to the *Project Follow Through. Project Follow Through* was conducted from 1968–1976, and was called the most expensive educational experiment ever conducted (Adams & Engelmann, 1996). Over 10,000 disadvantaged students participated in this project at an estimated cost of over $500 million. The primary project design was to evaluate nine different approaches to educating low-income students in Grades K-3. DI approaches were favored in over 87% of the studies, as compared to 12% for non-DI approaches. The most effective approach was DISTAR. The results of *Project Follow Through* showed that gains are achieved only by starting at the skill level of the children, and carefully building foundations that support higher-order structures. Adams and Engelmann stated that DI has no peer in this enterprise. More importantly, the successful DI model used thoroughly field-tested curricula that teachers should follow for maximum success. The *Project Follow Through* models that were based on a self-directed learner model approach were ranked at the bottom for both academic and affective achievement.

Criticisms of Direct Instruction

Theorist Piaget and others suggest that children should interact with their environment in a self-directed manner, and that the teacher is supposed to be a facilitator and provide a responsive environment (Adams & Engelmann, 1996). Thus, primary criticisms of DI are that it is teacher-centered and places too much emphasis on teacher talk (Arends, 2007). Also, critics say that teacher talk accounts for between one half to three fourths of every class period (Cuban, 1993), and that DI supports the view that students are empty vessels to be filled with carefully segmented information, rather than active learners with an innate need to acquire information and construct their own knowledge (Marshall, 1992). In addition, critics say that DI is used more often because much of the curriculum in the schools is developed around isolated acquisition of skills and the retention of basic information. Curricula in schools have been structured around bodies of information from the various academic disciplines, and curriculum guides, textbooks, and tests are similarly organized and are routinely used by teachers (Arends, 2007).

Summary of Direct Instruction

Experienced teachers know that DI is an effective (and efficient) way to help students acquire the array of basic information and skills believed to be important for students to know (Arends, 2007). Also, research has shown definite benefits exists in using DI to help students with learning disabilities to acquire and retain basic skills and information (Marshall, 1992). Moreover, a balanced use of DI and the use of several other approaches by effective teachers are the keys to effective instruction. It is also important to know when and with what learning goals to match instructional approaches to the needs of particular students.

Graphic Organizers

In the *Principles and Standards for School Mathematics*, from the National Council of Teachers of Mathematics (NCTM, 2000), emphasis is placed on real-world problem solving, including complex, open-ended problems that require students to find important information related to the problem, and to use it to organize and translate the information to mathematical symbols to find the problem solution. These skills can be very challenging for students with LD. The use of graphic organizers (GOs) has been validated to help students with LD approach the solving of mathematical word problems (Maccini & Ruhl, 2000). GOs are pictorial illustrations that are used to organize and highlight key information and or vocabulary. Usually, they contain words and or phrases to connect the content information in a meaningful way to help students (with and without learning disabilities) gain a clearer understanding of, and retain, the material (Fountas & Pinnell, 2001). There are three major types of GOs: hierarchical diagramming, sequence charts, and compare and contrast charts or Venn Diagrams. Overall Baxendral (2003) suggests that GOs be used with students, consistently, coherently, and creatively (2003).

There are two ways to use GOs in the classroom. Best practice for utilizing GOs in classrooms includes the use of both teacher-directed and student-directed arrangements (Lovitt, 1994). In fact, research suggests that both approaches are helpful for middle and high school students with LD within general education classrooms (Horton, Lovitt, & Bergerud, 1990). Also, many GOs can be found on the Internet, created by software designed for GO production, as well as in teacher resources. Additionally, and, perhaps, most importantly, the GOs used should be selected based on the objectives of the lesson.

The Problem

The middle school that is the subject of this research project was put on the list of high priority schools in fall 2007, due largely to the high number of students with learning disabilities (LD) that scored nonproficient in math in 2007 on the yearly TCAP (Tennessee Comprehensive Assessment Program test). The No Child Left Behind Act (NCLB) of 2001 and the reauthorization of the Individuals with Disabilities Education Act (IDEA) of 2004 also place increasing academic expectations on youth, and particularly on youth with disabilities (Educational Policy Research Reform Institute, 2002). To address the increasing, rigorous educational demands, and ensure access to the math curriculum for all students, teachers are encouraged to find ways to address these educational demands through the use of research-based strategies. Ways must be found to improve the math skills of students with LDs (Educational Policy Research Reform Institute, 2002).

Daily, as a teacher of seventh-grade math students, I continue to see the majority of students coded as having math LD in my classroom disengaged, and caught up in a cycle of failure that is very difficult to overcome. The problem that I would like to address in my classroom is this: “Does the implementation of small groups with the use of direct instruction and graphic organizers improve math skills for LD and students at risk of failing math?” Throughout this project, I also want to focus energy on discovering answers to the following question, as well: “What changes in attitude, motivation and participation among the students do these changes have?” Formative assessments, chapter quizzes, and informal assessments will be used to gauge student progress. Subsequently, research-based intervention strategies are needed in order to help reduce the number of nonproficient students. In addition, the researcher has noted that these students are rarely engaged in the regular classroom discussions and learning activities, and they continue to score poorly on formative assessments, quizzes, and unit tests.

Data Collection and Results

Method

Participants

The participants in this study were the students in an urban middle school math class. The class consisted of 22 students with mixed abilities. Four of the students were coded LD and received special services, and four students scored nonproficient on the TCAP test from spring 2007. All data mentioned in this study shows the results of the LD and nonproficient students. (Two additional students, one LD and one nonproficient, that were to be part of the group, were suspended for a majority of the study and are not considered in the results of the study.) In addition, other students are mentioned here only to describe the characteristics of the entire class. The remaining 12 students were on grade level, and had average to above average grades. There were four males and two females in the group that is focused on for data interpretation. As was indicative of the school's total population, 91 percent of these students were enrolled in the free and reduced lunch program, and all of the students were African American. About 60 percent of the students were at or above grade level in reading and mathematics; the remainder were below grade level.

The instructors of this project were the classroom teacher (also referred to as the lead teacher), the special education teacher, and one classroom assistant (two volunteers were used; each had a college degree and experience working in a classroom environment). The lead teacher trained the other instructors on the methods used in the study, and also made sure that the students were orientated to the other instructors prior to the start of the study. The lead classroom teacher taught the group of students with learning disabilities and those that scored nonproficient on the spring 2007 TCAP test. The remaining students were split into groups, and were taught by the teaching assistant and special educator.

Scripted lesson plans were developed by the lead teacher, and were made available and reviewed with the appropriate instructors. Lesson plans were given to the instructors 1 week in advance to review prior to instruction. Also, the lead teacher reviewed the lesson plans with the other instructors. Reflections of the implementation of the lessons, and additional details as to the success of the lesson, were collected (see Appendix A) and are reflected upon in the Conclusions and Recommendations portion of the paper.

Materials

Materials used in the classroom were typical materials used in a seventh-grade classroom: the usual system approved textbooks; 20 computers with Cognitive Tutor, Bridge to Algebra software; and a variety of manipulative and materials characteristic of a seventh-grade math classroom. For this action research study, detailed scripted lesson plans, with tailored graphic organizers, were prepared in advance for participating instructors. The lead teacher also provided all special materials.

Procedure

Students were selected for pull-out groups (which lasted 20 to 45 minutes, two times per week) based on their math learning disability, TCAP Scores from spring 2007, and current classroom performance. All nonproficient students and students in danger of failing math were also placed in the pull-out group that was taught by the lead teacher, and the results are recorded and analyzed in this study. On average, there was one instructor assigned to six students, with the regular instructor assigned to the participants of the study that were LD and/or at risk of failing math. The assistant instructors worked with the other students of the class in small groups in different classrooms.

The primary instructional methods used in the study were in contrast to those taking place in the other three class periods of seventh-grade math students. In the other class periods, students were placed in cooperative groups to use discovery learning to solve problems associated with the math topics being taught. The average teacher-to-student ratio was 1 teacher for 22 students. In contrast, the participants of this study were moved to another room, and were taught using direct instruction and advanced graphic organizers, with a teacher-to-student ratio of one to seven. The sessions took place three times each week for 20 to 45 minutes. Also, students were required to begin homework assignments, with teacher feedback and guidance toward successful completion. Formative assessments included homework problems, and guided practices were done during the sessions. Participants took all unit tests and quizzes with the regular class.

Attitude surveys (see Appendix B) were given at the end of the project to gauge the participants' views on the project and its effect on their math skills. The results are shown in Figure 3. This study had a duration of 3 weeks.

Results

Each student in the small group taught by the regular instructor was given a pre-test and post-test (see Appendix C) to assess knowledge gained. Test scores on the pre- and post-test assessments were compared and are presented in Figures 1 and 2. There was a significant difference in the pre- and post-test results, with an average gain of 50 percent in the number of questions answered correctly on the post-test, when compared to the pre-test. The average score for the group of six students on the pre-test was 2.5 (25 percent) correct answers out of 10 questions, while the average score of questions answered correctly on the post-test was 5 out of 10 (50 percent) correct answers. While the actual score on the post-test was not a passing score, the improvement in the performance of the students was impressive. One third of the students improved their score by answering one additional question correctly, while the other two thirds improved their scores by answering three or more additional questions correctly.

Student Number	Pre-Test	Post-Test	Increased Score
1	3	6	+3
2	4	5	+1
3	3	4	+1
4	2	5	+3
5	2	6	+4
6	3	4	+1

Figure 1. Table pre-/post-test data for students with LDs and risk of academic failure.

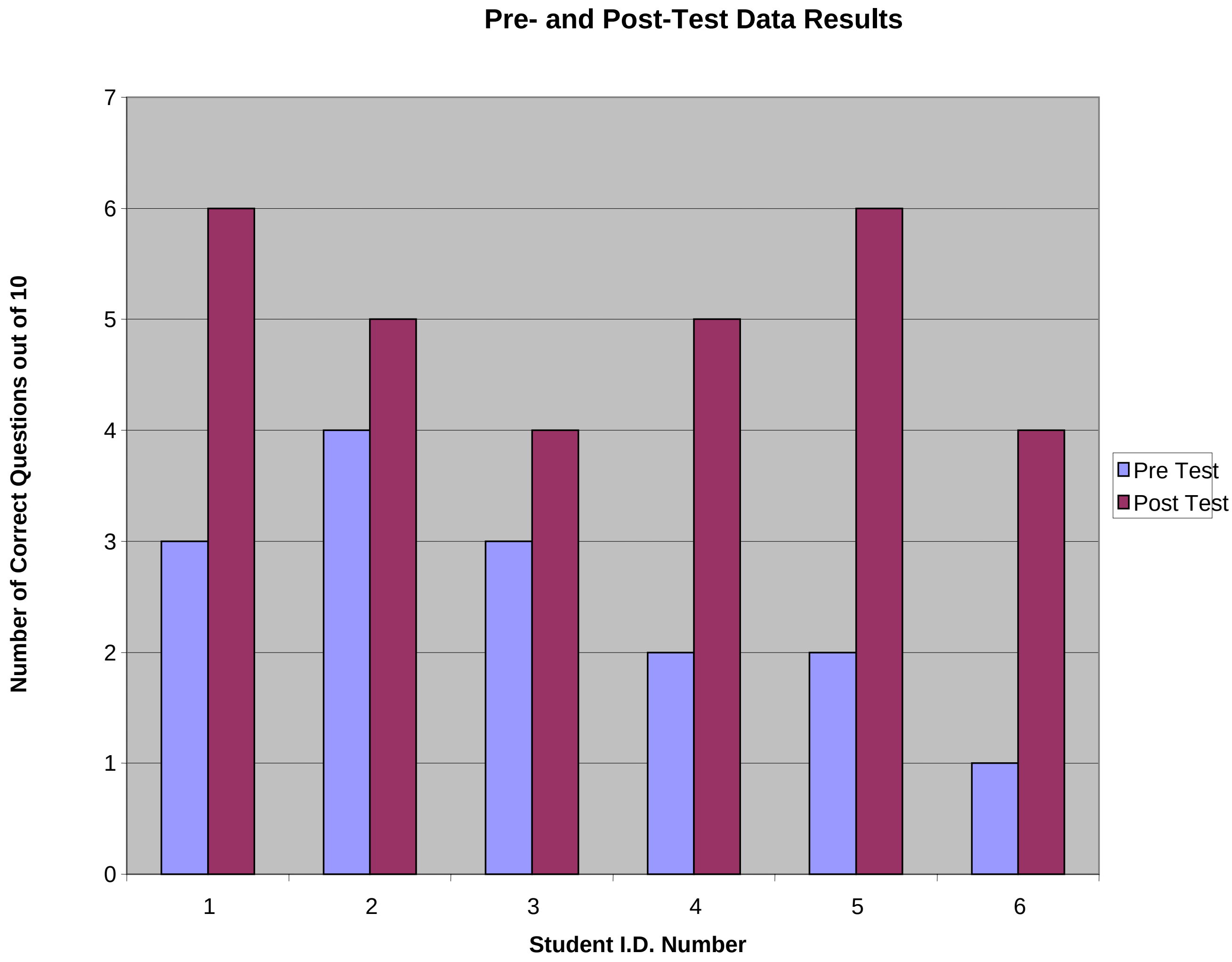


Figure 2. Pre-/post-test data for students with LDs and risk of academic failure.

The pre- and post-attitude surveys (Appendix B) showed no significant improvement in each of the areas surveyed. When students were asked, “How do you feel about math in school?,” for both pre- and post-project implementation, the answer given by four out of six of the students was “Not Good;” two of the six students responded with “Good” on at least one question (see Figure C). Traditionally, these students pay little attention to the class discussions, group work, or direct instruction, so, even though there was not much improvement in their attitudes, the instructor was not disappointed or surprised by the results. It is also important to note that all instructors thought that the students were more productive during the project than they were during the regular class times.

Attitude Survey Question	Response Student 1	Response Student 2	Response Student 3	Response Student 4	Response Student 5	Response Student 6	Average Response
1. How do you feel about math in school?							
Pre-Test Response	3	3	2	3	3	2	2.7
Post-Test Response	3	3	2	2	2	2	2.3
2. How do you feel about doing math at home?							
Pre-Test Response	3	3	3	3	3	2	2.8
Post-Test Response	2	3	3	2	3	2	2.5
3. How do you feel about working on math with a small group and an							

instructor?							
Pre-Test Response	3	3	3	3	3	2	2.8
Post-Test Response	2	3	3	2	3	2	2.5
4. How do you feel about using your related arts time to work on math?							
Pre-Test Response	3	3	3	3	3	3	3
Post-Test Response	3	3	3	3	3	3	3
5. How do you feel about learning a new skill or concept in math?							
Pre-Test Response	2	3	3	2	3	3	2.7
Post-Test Response	2	3	3	2	3	3	2.7
6. How do you feel about using manipulative(s) to learn math concepts?							
Pre-Test Response	2	2	2	3	3	3	2.5
Post-Test Response	2	2	2	3	3	3	2.5

KEY to Response Numbers 1 = Great 2 = Good 3 = Not Good

Figure 2. Attitude survey question average results for pre- and post-administration responses.

Conclusions and Recommendations

Reducing the number of students in a classroom is a popular strategy for raising test scores, and it's one that has some evidence of success (Viadero, 2008), as this research verifies. The only problem is that the cost to do this in the short-term is hard to justify in today's climate of hiring freezes, limited resources, and budget cuts. The only way that this researcher was able to conduct this project was to solicit volunteers to help in the classroom for 3 weeks. Viadero estimates that boosting high school graduation rates would save United States $127,000 per new graduate (Viadero, 2008), and could be achieved through successful implementation of one of five cost effective educational strategies (one of the five strategies includes reducing classroom size). So, I anticipate and encourage additional research in my school, as well as across school systems. Hopefully, policy makers will take note of the value of smaller class size for improvement in achievement for LD and high-risk students.

Although this researcher found that it took more preparation and planning time to prepare scripts for all lessons taught (on average, 2 to 3 hours of planning per script), that it was well worth the time. All of the instructors involved in this project found that the use of the direct instruction teaching method (with the use of prepared scripts) also helped students cover more material, start and complete home work more often, and, also, participate in classroom discussions. The scripts also helped instructors anticipate problem areas that the students might have, and prepared consistent explanations, tips, etc., to assist students.

Cost benefit analysis, budget cuts, hiring freezes, limited resources, and the limited number of highly-qualified math instructors will not help make this project easy to implement across the county, or even in this school. This researcher firmly believes that, for high-risk students, this may be the best hope that we have for, indeed, leaving "no child behind." While the results of this research may or may not produce long-term benefits, the short-term improvements are hardly deniable. Advocates of direct instruction are becoming more vocal, these days, as it relates to benefits for LD students and high-risk students (Fountas & Pinnell, 2001), and research-based strategies are also becoming required. This researcher can only hope that finding ways to lower the teacher-to-student ratio will continue, so as to benefit students that really need this type of instruction.

References

Adams, G., & Engelmann, S. (1996) *Research on direct instruction: 25 years beyond DISTAR.* Seattle, WA: Education Achievement Systems.

Arends, R. I. (2004). Learning to teach (6th ed., pp. 296-323). New York, NY: McGraw-Hill.

Baxendral, B. W. (2003). Consistent, coherent, creative: The 3c's of graphic organizers. *Teaching Exceptional Children, 35*(3), 46-53.

Cuban, L. (1993). How teachers taught: Constancy and change in American classrooms, 1880-1990 (2nd ed.). New York, NY: New York College Teachers Press.

Educational Policy Research Reform Institute (EPRRI). (2002, Spring). Policy updates, issue one. College Park, MD: University of Maryland, Educational Policy Research Reform Institute, The Institute for the Study of Exceptional Children. Retrieved April 24, 2003, from http://www.eprri.org

Fountas, I. C., & Pinnell, G. S. (2001). *Guiding readers and writers grades 3-6: Teaching comprehension, genre, and content literacy*. Portsmouth, NH: Heinemann.

Gagnon, J., & Maccini, P. (2002). *Direct instruction in middle school mathematics for students with learning disabilities*. The Access Center Improving Outcomes for all Students K-8. Retrieved October 1, 2007, from http://www.k8accesscenter.org/

Gagnon, J., & Maccini, P. (2005). Math graphic organizers for students with disabilities. The Access Center Improving Outcomes for all Students K-8. Retrieved October 5, 2007, from http://www.k8accesscenter.org/

Horton, S., Lovitt, T., & Bergerud, D. (1990). The effectiveness of graphic organizers for three classifications of secondary students in content area classes. *Journal of Learning Disabilities, 23*(1), 12-22.

Lovitt, S. V. (1994). Strategies for adapting science textbooks for youth with learning disabilities. *Remedial and Special Education*, *15*(2), 105-116.

Maccini, P., & Ruhl, K. (2000). Effects of a graduated instructional sequence on the algebraic subtraction of integers by secondary students with learning disabilities. *Education and Treatment of Children, 23*, 465-489.

Marshall, H. H. (1992, Apr. 22). Reconceptualizing learning for restructured schools. Annual Meeting of the American Educational Research Association (San Francisco, CA).

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: Author.

Rosenshine, B., & Stevens, R. (1986). Teaching functions. In M. C. Witrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 376-391). New York: Macmillan.

Sommers, J. (1991). Direct instruction programs produce significant gains with at-risk middle school students. *Direct Instruction News*, *11*(1), 7-14.

Tarver, S. G. (1992). Direct instruction. In W. Stainback & S. Stainback, *Controversial issues confronting special education: Divergent perspectives* (2nd ed., pp. 143-165). Boston: Allyn & Bacon.

Viadero, D. (2008, April 9). New center applies cost-benefit analysis to education policies. *Education Week*, *27*(32), 1, 12. Retrieved April 10, 2008, from http://www.edweek.org/

White, S. (2005). *Education that works*. Wisconsin Policy Research Institute Report. Wisconsin Policy Research Institute. Retrieved December 8, 2008, from http://www.wpri.org/Reports/Volume18/Vol18no4.pdf

Appendix A

Observation Recording Sheet Observer ______________________

Date ____________________________________ Group I.D. _____________________________

Students not present ____

Activities ____

Check Activities Completed. Please list the Activities for the group on the first line. Comment on individual students in the boxes.

Student Name	Activity 1	Activity 2	Activity 3
1.			
2.			
3.			
4.			
5.			
6.			

Appendix B

Pre-/Post-Attitude Survey for Small Group Instruction Participants

Answer the following questions by using a scale from 1 to 5 with:

1 = Great 2 = Good 3 = Not Good

1. How do you feel about math in school? __________

2. How do you feel about doing math at home? ______

3. How do you feel about working on math with a small group and an instructor? _________

4. How do you feel about using your related arts time to work on math? __________

5. How do you feel about learning a new skill or concept in math? __________

6. How do you feel about using manipulative(s) to learn math concepts? __________

7. Put a check by your answer or circle Yes or NO
How often do you work on homework? Do you get help at home?

_______ No days a week Do you get help? Yes or NO
_______ 1 day a week _______ 2 days a week
_______ 3 days a week _______ 4 days a week

Appendix C

Pre-/Post-Test

.

1. Write 6,465 in scientific notation.

- ☐ **A.** **6.465×10^4**
- ☐ **B.** **646.5×10**
- ☐ **C.** **64.65×10^2**
- ☐ **D.** **6.465×10^3**

2. Write 4,564,000 in scientific notation.

- ☐ **A.** **45.64×10^5**
- ☐ **B.** **4.564×10^5**
- ☐ **C.** **$4{,}564 \times 10^3$**
- ☐ **D.** **4.564×10^6**

3. Write 720,000,000 in scientific notation.

- ☐ **A.** **12×10^7**
- ☐ **B.** **1.2×10^9**
- ☐ **C.** **1.2×10^8**
- ☐ **D.** **0.12×10^9**

4. Which symbol makes the following statement true? 3.25×10^3 _____ 325

- ☐ **A.** =
- ☐ **B.** ≤
- ☐ **C.** <
- ☐ **D.** >

5. Which symbol makes the following statement true? 1.55×10^4 ______ 15,000

- ☐ **A.** <
- ☐ **B.** =
- ☐ **C.** >
- ☐ **D.** ≤

6. 2 cm = ______mm

- ☐ A. 20
- ☐ B. 2
- ☐ C. 0.2
- ☐ D. 20o

7. 523 m = _______ km

- A. 5.23
- B. 0.0523
- C. 0.523
- D. 523,000

8. 7,939 mg = _______ g

- A. 79.39
- B. 0.7939
- C. 7.939
- D. 7,939,000

9. 2.3598 kL = _______ L

- A. 0.0023598
- B. 235.98
- C. 23598
- D. 2,359.80

10. 57 mL = _______ L

- A. 0.57
- B. 57,000
- C. 0.0057
- D. 0.057

Calculator Use in an Eighth-Grade Algebra Classroom: Help or Hindrance?

Vivian M. Jackson

Education 590, Spring 2006

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-114.

Introduction to the Problem

Calculator use should be monitored in the mathematics classroom. This research has been designed to show that, as calculator use is monitored, the students' level of knowledge should increase, allowing more in-depth content knowledge of mathematics to take place. Calculators are considered an accommodation for some students on any given assessment or assignment. These students, along with others in classrooms throughout the United States, rely heavily on calculators to perform basic mathematical computations such as addition, subtraction, multiplication, and/or division. Calculators are needed in a mathematics classroom, like algebra, but not all the time. In addition, this research should show that, as students understand the mathematics in context, their confidence and engagement levels should increase. Accordingly, more students should perform better on classroom assignments, formative measures, and summative tests; therefore, increasing the number of students that move on to high school and college prepared for the content presented in those settings. Many low-achieving students enter classrooms all over America desiring to be successful. If these students can be supported in a way that increases their confidence, instead of decreasing it, the learning environment for all students could change on a positive note.

As professionals, we are concerned that we have given students too much freedom to use calculators in the mathematics classroom. Attempts made to control the use of calculators in the classroom have, unfortunately, frustrated many students; consequently, they still perform poorly on classroom formative assessments and state summative assessments. Furthermore, some students fail to grasp the main focus of the lessons, whether calculators are used or not. The search for additional data begins with the following questions:

1. How does the use of calculators help or hinder student progress?

2. What happens to student performance, confidence, and engagement in the absence or presence of calculators in the classroom?
3. What happens to homework completion rates in the absence or presence of calculators?

To address these questions, data will be gathered from an eighth-grade,
algebra classroom.

Review of Literature

The use of calculators as a teaching aid, and their effects on student learning, has been a matter of debate among educators and the general public for a very long time. Golden's study (cited in Beswick, Brown, Howe, Jones, Karp, Petrosko et al., 2007) showed that the use of calculators in the classroom has caused a huge reduction in students' ability to do well on computational problems where calculators are banned. Conversely, a study by Hembree and Dessart (cited in Beswick et al., 2007) revealed that there is neither a positive nor a negative effect on the computational skills of students based on their use of calculators. Additionally, their study found that most students (except those in fourth grade) who used calculators, along with traditional mathematics instruction, seemed to improve their basic skills, both in computational operations and in problem solving. According to the National Council of Teachers of Mathematics (NCTM) (2003), technology is necessary in teaching and learning mathematics; it directs the mathematics that is taught and boosts student learning. The NCTM (2003) also states that teachers must use a balanced approach with students in developing their understanding of when a calculator is needed. Furthermore, teachers must recognize the significance of calculator use in students' conceptual comprehension of mathematics, and determine the appropriate use of calculators in the mathematics classroom.

Similar to the thoughts of NCTM, Lukas (2005) has determined that there are three notions regarding calculator use: the calculator as a teaching aid, a tool, and a learning aid. As a teaching aid, the calculator serves to assist the teacher with planning and delivery of lessons. As a tool, the calculator serves to help the student perform operations with ease and timeliness. As a learning aid, the calculator helps students to focus on the "big ideas" and/or the content, apart from the process. As a teaching aid, Rider (2007) states that instructors can use calculators to demonstrate multiple representations that usually help students solve problems, and, simultaneously, demonstrate comprehension. Furthermore, Simmt's study (as cited in Rider, 2007) showed that, if traditional teaching practices are used with graphing calculators, the calculator only provided additional visuals, but did not improve student comprehension. With this notion, teachers must refocus their method on how they plan and deliver lessons. As a learning aid, students can make connections with mathematical content and solutions. Students are able to formulate questions such as, "I wonder why that happened?," "What if I tried this?," "Why is that solution correct?," or "How do I solve this problem?" in order to make the needed mathematical connections. As a teaching tool, students are able to do basic computations, create graphs and tables, and verify answers. Using calculators as tools, students can also draw upon numerous strategies in order to arrive at a solution from the beginning to end, or from end to the beginning. Using this notion, students are given the opportunity to construct their own meanings (Rider, 2007).

Lukas (2005) continues to develop an even more balanced focus on not how calculators are used, but when. He states that, if we are to use calculators in our practice as a tool, we should provide some structure. A structure, as shown below, affords us the opportunity to decide where and why calculators should be used in our teaching. He suggests the following:

- Calculator free: non-calculator sections, work planned to be accessible to students with numerical competency (consolidation), or given as a vehicle for the development of numerical competency. The numerical component is not such that important concepts are confused by computations.
- Calculator friendly: work in which a calculator is an obvious choice of tool to accompany and enhance the application of mathematical concepts and execution of processes. This may be numerical, graphical, or experimental, and can be done by traditional methods but would be tedious and time consuming.
- Calculator focused: work in which sophisticated calculator use, or the use of a sophisticated calculator, brings to the classroom possible concepts or problem types that are unapproachable without the technology. This is technology dependent work, and would encourage the creative use of technology in a problem solving environment. (p. 39)

Lukas (2005) is on the right track with his suggestions regarding calculator use in the mathematics classroom. There are times when teachers must assess the basic knowledge a student possesses, and the student should use mental math instead of technology. This would represent the calculator free assessments. On the other hand, a teacher may choose to use a calculator on some sections of an assessment due to the knowledge tested or on other sections where it would be time consuming not to use a calculator. Therefore, in a calculator friendly environment, the student, in most cases, decides if he or she should use a calculator. This gives the student the freedom to discover his or her own level of knowledge. Finally, the calculator focused classroom presents situations where students must be supplied calculators due to the nature of the assignments given. In this environment, both teacher and student should be knowledgeable regarding the proper use of technology. Students, in this situation, are usually in advanced mathematics courses.

Margaritis (2003) states:

> if we are to encourage and allow the use of calculators in our mathematics classes, it is my firm belief that graphing calculators should be used instead of simple calculators. Graphing calculators present an ideal instrument for learning mathematics. First, they incorporate a portable environment that may be used both at school and at home. Second, if used correctly, they provide the students with a tool that fosters learning and thinking by providing immediate feedback that will support their reasoning. (p. 42)

Graphing calculators allow both students and teachers the avenue to investigate, explore, compare, and discover concepts in a more comprehensive manner than simple calculators, or no calculators, at all (Margaritis, 2003).

It is with the focus of the calculator as a teaching aid, a tool, and a learning aid, in addition to the three-tiered use focus, that this research was based. Concerns are that, if the teaching profession does not carefully determine the focus of our use of calculators and how they serve our students, more students will be left behind and/or ill-equipped for current and higher learning.

Data Collection and Results

Data Collection

Participants

The participants in this study were 21, eighth-grade Algebra students at an inner city magnet school in Chattanooga, Tennessee. The total population of the Grades 6-8 school is 450 students, with an approximate ratio of 3 males to 4 females. Although some racial diversity exists, most of the students are African-American (97%). The remaining 3% is divided among Caucasian (2%) and Hispanic (1%). These students are enrolled in the free and reduced lunch program, and are labeled as economically disadvantaged by state standards. The students presented in this study are transient. Most of them move at least once every year (some more than that). About two thirds of these students have one parent either incarcerated or “missing in action.” The other one third spends most of their time being the parent to smaller siblings while their parent or guardian works. More than one half of the students are performing below grade level.

In the eighth-grade math course, students are divided into Algebra IA, Algebra I, and Honors Algebra I. Currently, there are 65 students registered in Algebra IA. Of this 65, only 21 are represented in this study, and 6 of those students have been designated with a learning disability. In this eighth-grade class, there is one inclusion teacher (a teacher who specifically helps those with learning disabilities) who serves the students. These students are serviced (assisted by the inclusion teacher to complete assignments) twice per week for 80 minutes per day. In addition, the class receives the assistance of a GEAR-UP tutor from The University of Tennessee at Chattanooga who visits the classroom twice per week for approximately 4 hours per day. This arrangement allows students who need additional help to receive one-on-one assistance.

Materials

Materials used in the classroom are typical materials used throughout Hamilton County middle schools. The current Algebra I curriculum (*Cognitive Tutor for Algebra I*) was designed by the Carnegie Learning Company. This curriculum comes with a computer use component. The classroom is organized in a “U” lecture style, with round tables surrounding the perimeter for group and individual work. Only the current curriculum and the current technology available to students were used. Most of the data was collected during class. The remaining data was collected from students' homework assignments. The majority of the students do not have computers, calculators, or Internet access outside of the classroom. Due to this fact, the face of a calculator (TI-84) was copied for their use at home on homework.

Procedure

In this study, the use and non-use of technology (graphing calculators) in the mathematics classroom was the focus. The focus of the research was to collect data based on daily student performance. Student performance was based on homework completion, summative, and formative tests. For homework, students used "their" calculator in order to practice the proper key strokes to arrive at a solution. In class, on the following day, students completed their calculations based on their noted keystrokes to arrive at a solution. If students did not record keystrokes properly, their solutions could be incorrect. In addition, scores on a pre- and post-test were used to monitor student performance based on prior knowledge, developing knowledge, and subsequent knowledge.

The students also completed a Star Math test. This test measured their degree of progress between two testing periods. Specifically, this data was used to show student performance with and without the use of calculators. Students performed the assignments as individuals. Pre- and post-surveys were given to discover what the students thought about how calculators should or should not be used in the mathematics classroom.

One literacy strategy, "Splash," was used to make, as certain, as possible, that the issue was not comprehension, but the improper use of technology. Splash is a vocabulary/comprehension strategy used to determine if a student understands the main focus of the lesson. Students chose a vocabulary term from previous lessons, and created their own understanding through the use of related terms, symbols, and diagrams. Each student shared his or her results with the class. Students worked as individuals and in groups to complete this assignment. The students' products were used to change our algebra word wall.

Results

At the start of the 4-week study, students completed a 20-question survey (see Appendix A) regarding why they think calculators should or should not be used in the mathematics classroom (see Figure 1).

In Question 6, the students were asked to specifically discuss calculator use in the mathematics class. The majority of the students stated that they use their calculator to solve math problems. Based on their responses, no evidence was shown that the problems presented for solving were basic or algebraic in nature. Some of the responses in Question 12 were similar to those in Question 6. Other responses to Question 12 were to help understand the math, to check answers, and to be able to work without assistance.

For Question 13, students listed the basic mathematical operations as the keys they use the most. Reviewing Question 16, 10 out of the 16 students felt that their grade should be higher, while the remaining 5 students stated that their grade was on target. Most students struggle with math in some area or another. Hence, responses to Question 18 revealed several areas: fractions, equations, graphs, multiplication, and division. Of the 16 respondents, 7 students listed fractions and equations as areas where they struggle most.

Questions	Yes	No	Sometimes	I do not know
1. Do you have unlimited access to calculators during mathematics class?	13		3	
2. I can understand the lesson better when I use a calculator during mathematical investigations?	13		3	
3. Mathematics is more interesting and exciting when I use a calculator?	10	3	3	
4. Do students who use calculators have an unfair advantage over students who do not use calculators?	7	6	2	1
5. My teacher decides when a calculator should be used to solve math problems.	10	2	4	
6. What do you use your calculator for in the mathematics class? Be specific.				
7. Should all students have access to calculators during mathematics instruction?	13	1		2
8. Do you have math homework?	9		7	
9. Do you have access to a calculator at home?	11	5		
10. If you had a calculator at home, would you complete your homework?	13		2	1
11. When homework is given, do you complete it even if you do not need a calculator?	6		10	
12. Why should calculators be available for use in the mathematics classroom?				
13. Looking at the face of the calculator, what keys do you use often?				
14. Do you participate in a math tutoring program?	6	9	1	
15. What is your current grade in Algebra I?	4 B's	8 C's	2 D's	2
16. Be honest. Should your grade be higher, lower, or is it right on target?				1
17. Are you happy with your current grade?	6	5	4	1
18. What is your greatest struggle in your math class?				4
19. Is the calculator you currently use in your math class difficult for you? Why or why not?	1	13	1	1
20. Do you think you could do better with a different calculator? Why or why not?	6	9		1

Figure 1. Student responses to survey. Note. Questions 6, 12, 13, 16, and 18 have written comments.

Accordingly, the information provided in Figure 2 shows that students who struggled in these areas before testing continued to struggle after topics had been discussed, based on their post-test scores. Students used calculators to complete a comprehensive pre-test based on their current Algebra I curriculum. These results were tallied and recorded (see Figure 2). This assessment provided the base for this study. As shown in Figure 2, the majority of students scored lower on the post-test. Two students had no change and one student had a slight increase in post-test scores. Furthermore, one can conclude, to this point, that the use or non-use of calculators was not the major issue.

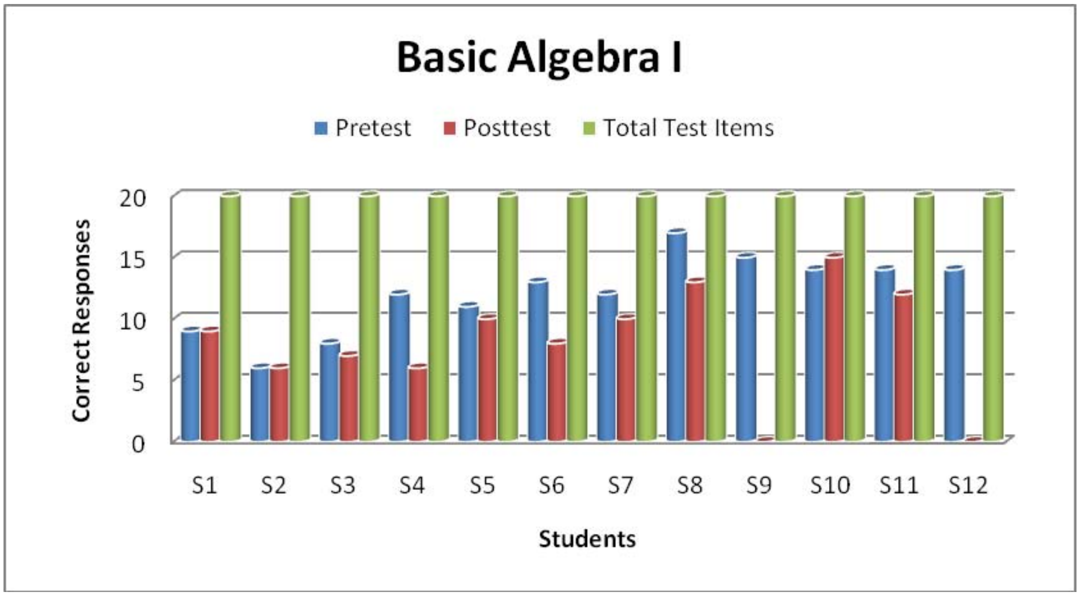


Figure 2. Pre- and post-test scores. Note. Only 12 participants were available for the pre-test; only 10 participants were available for the post-test.

Next, the students were given five homework assignments (see Appendix B) based on skills tested on the pre-test (see Appendix C). The students were asked to record calculator key strokes on each homework assignment. Students were instructed to only complete one assignment per day. The next day, students were to follow their key strokes to arrive at a solution for each problem. This data was designed to show that if a student followed steps in solving a problem, and, calculated incorrectly, the mistake could be seen quickly. In each case, the results were to be recorded. The students did not perform this portion of the study as planned. Only 5 out the 16 participants attempted to complete this assignment. One out of five participants completed all five assignments. Another completed four out of five assignments. The remaining three participants completed between one to three assignments. Consequently, the post-test scores (see Figure 2) reflect that there was no increase in knowledge, based on the items proposed for homework practice.

During the last week of the study, students took 2 days to complete Star Math tests. The first test was taken without the use of a calculator. The second test was taken with the use of a calculator (see Figure 3). All of the students used a TI-84 calculator. This particular assessment was added because of the nature of the testing items. Students were tested on numeration and computation objectives. Numeration objectives assessed were place value from ones to hundred thousands; fractions and decimals; and advanced concepts (e.g. square roots, squares). Some of the computation objectives evaluated were addition, subtraction, multiplication, and division basic facts; fractions and decimals; and percents, ratios, and proportions. This assessment also depicts the student's grade equivalent (GE) score. For example, according to the Star Math Diagnostic Report, student (S4) whose GE score was 3.7 is comparable to an average third grader, after the seventh month of the school year.

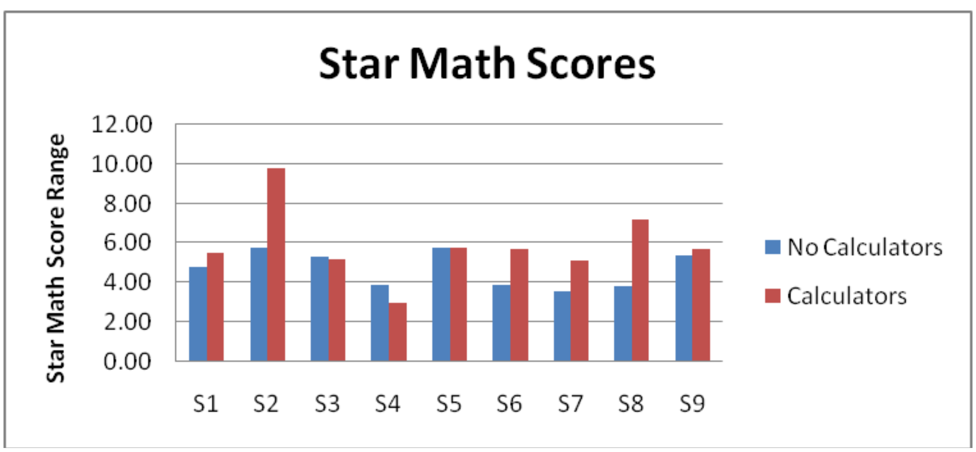


Figure 3. Students' Star Math scores. Note. Out of the 16 respondents, only 9 were available for both testing sessions. Only S5 showed no change. S2 showed the greatest improvement, and S3 and S4 actually performed best without the use of calculators.

At this stage, the student:

- should recognize place-value in hundreds and million.
- should continue practicing adding, subtracting, multiplying, and dividing.
- should begin estimating by rounding numbers.
- should learn to use a calculator with larger numbers.
- should begin work with fractions.

Conversely, student (S5) whose GE score remained unchanged, with or without a calculator, was 5.8, similar to an average fifth grader, after the eighth month of the school year. At this stage, the student:

- should keep learning fractions and decimals.
- should keep learning to convert fractions to decimals.
- should begin to add and subtract fractions with unlike denominators.
- should begin to learn advanced math concepts such as square roots and exponents.

Since most of the scores, without calculator use, were 5.8 and below, one can assume that most of the students are still developing skills that should have been mastered in elementary school. This could be another reason why the scores remained unchanged and/or dropped on the test with the assistance of calculators. In view of this, many of the students taking Algebra IA may need remedial math lessons in order to bring them up to grade level on some objectives. Thus, calculator use was not shown to help or hinder the student performance on this form of assessment.

At the end of the 4-week study, students were given a post-test (see Appendix C) to compare results against the pre-test taken earlier. The data comparisons have shown that the students probably lacked the prior knowledge to complete the test questions successfully. Therefore, the post-test results remained unchanged, or dropped, according to Figure 2.

Finally, students participated in a post-study survey (see Figure 4, Appendix D) regarding their thoughts at the end of the study.

Questions	Yes	No	Sometimes	I do not know
1. Did you have unlimited access to calculators during mathematics class?	10		1	
2. Did you understand the lesson better when you used a calculator during mathematical investigations?	7		4	
3. Was mathematics more interesting and exciting when you used a calculator?	7	3	1	
4. Did students who used calculators have an unfair advantage over students who did not use calculators?	2	8	1	
5. Did your teacher decide when a calculator should be used to solve math problems?	4	5	2	
6. What did you use your calculator for in the mathematics class? Be specific.				
7. Should all students have access to calculators during mathematics instruction?	10			1
8. Did you have math homework?	3	4	4	
9. Did you have access to a calculator at home?	6	4	1	
10. If you had a calculator at home, did you complete your homework?	10	1		
11. When homework was given, did you complete it even if you did not need a calculator?	8	2	1	
12. Should calculators be available for use in the mathematics classroom?	11			
13. Looking at the face of the calculator, what keys did you use often?				
14. Did you participate in a math tutoring program?	2	8	1	
15. What is your current grade in Algebra I?				8
16. Be honest. Did your grade improve?				1
17. Were you happy with your current grade?	4	2	1	1
18. What was your greatest struggle in your math class?				4
19. Was the calculator used in your math class difficult for you? Why or why not?		11		
20. Do you think you could do better with a different calculator? Why or why not?	2	7		1

Figure 4. Student responses to post-survey. Note. Questions 6, 13, 15, 16, 17 and 18 have written comments. Only 11 of the 16 respondents were available for this survey.

In Question 6 of the post-survey, the students were asked to specifically discuss how they actually used the calculator in the mathematics class. Similar to the response on the pre-survey, the majority of the students stated that they used their calculator to solve math problems. Again, most of them stated that the calculator was used to check answers and to do the “math.”

Responses from Questions 15, 16, and 17 were linked on the post-survey. It was surprising to discover that, for Question 15, most students said they did not know what their grade was; therefore, their responses to Questions 16 and 17 were not needed. In the response to Questions 16 and 17, only two students stated what their grade actually was, and that they were not happy with their current grade. One student listed an “A” as their current grade; the other student listed a “D.” Comparable to the pre-survey, most students continued to struggle in the same areas: fractions, equations, graphs, multiplication, and division. Of the 11 respondents, 4 students listed fractions, equations, graphing, and order of operations as areas where they struggled most. The total respondents should have been 11, but one student failed to answer Question 20 on the post-survey; hence the total responses were 10.

Summary

Student performance did not increase, as initially expected, with the use of calculators. Assumptions were made because the students have always used calculators on every assignment. If calculators were taken away, then their scores would decrease, and when they were returned, scores would automatically increase. One point that I have concluded is that, if the student did not understand the question being presented, calculator use was typically not a factor. Most of the students were concerned with “getting” the correct answer and not with having the proper reasoning and/or analytical abilities. I do not believe that the students in this study made the necessary connections between calculator use and content mastery. This is evident by the survey responses.

The students revealed that they were working at the fundamental level while using calculators. They were using the calculators to make basic computations and to verify answers. This action is similar to using the calculator as a teaching tool. As a teaching tool, calculators should also help students visualize their own thinking and learn from their mistakes. If the students had followed through with the entire 4-week study, based on how it was designed (with some adjustments), I believe their performance on the post-test would have been considerably higher than their pre-test scores. Similarly, since calculator use did not appear to be the issue, their Star Math Scores would have surpassed their initial assessment, with or without calculator use. In addition, their GE would have been on the middle school level (perhaps not eighth grade).

Conclusions and Recommendations

Conclusions

Students, in general, have lacked the proper knowledge of when and how to use a calculator. Some students, today, assume that they must always use a calculator in math classes, even if the assignment does not require one. Although teaching the content is important, we in the math profession must also teach our students how, why, and when to use a calculator. Students should have access to more than one type of calculator in middle school. As students progress from one grade to the next, their calculator training should also progress. Similarly, as students progress from a basic to a more advanced level of mathematics, their calculator use and calculator type should adjust, accordingly. This means that teachers, themselves, must be comfortable in using different types of calculators and different forms of technology in the classroom. Furthermore, as teachers focus on moving their students to higher levels of thinking, they must also move them to the higher levels of functioning with calculators.

My research showed that calculators, whether needed or not, gave my students more confidence just to know that they were available for use. In this case, having calculators available in the classroom did tend to increase student confidence and engagement. On the other hand, I believe student performance was not helped, but hindered, by the presence and absence of calculators. This was seen in the Star Math scores.

Students normally take the Star Math tests without the use of calculators, unless they have a learning disability that requires the use of one. Therefore, students assumed that their performance would improve if calculators were available for use. Calculators are to be used as a tool in the mathematics classroom. It is not the only tool, nor should it be substituted for student learning.

Homework completion rates were not measured properly because the students failed to complete the assignments, as instructed. The students attempted to complete all five homework assignments in one sitting and they were frustrated because it was lengthy. Conversely, the results from the surveys revealed that most students stated that they would complete their homework, if they had calculators at home. Unfortunately, the homework completion rates will need to be revisited.

Recommendations

More teachers should participate in professional development courses and/or simply read the research that has already been done, and adjust their lesson delivery based on what fits their students. Once we, as a profession, are educated on what works and what doesn’t, we can then pass the knowledge on to our students, and, perhaps, create a domino effect on learning. As we learn better, our test scores, whether formative or summative, should be better. Accordingly, the level of student engagement should improve, creating a positive effect on the learning environment.

Over the last few years, funds have been available locally to assist teachers in their quest to improve their knowledge of calculators. Texas Instruments, the manufacturer of the TI-84 calculator, have regional and state-wide user group meetings to troubleshoot problems and to enlist suggestions on how teachers can help students utilize different aspects of technology with calculators. Our local school districts have also provided summer institutes and training to assist teachers in their quest to improve student learning. The University of Tennessee at Chattanooga holds week-long sessions to not only improve teacher delivery of mathematics, but also to foster student learning with and without the use of technology. We live in a world where technology is necessary, but we must first learn how technology is to be used and why it is to be used.

References

Beswick, G., Brown, E. T., Howe, C., Jones, J., Karp, K., Petrosko, J. M., et al. (2007). Crutch or catalyst: Teachers' beliefs and practices regarding calculator use in mathematics instruction. *School Science and Mathematics, 107*(3), 102-116.

Lukas, P. (2005). A curriculum model for calculator use. *Micromath, 21*(2), 38-40.

Margaritis, A. (2003). Using graphing calculators in the Montessori middle school classroom. *Montessori Life, 15*(2), 42-43.

National Council of Teachers of Mathematics. (2003). *The use of technology in the learning and teaching of mathematics*. Reston, VA: Author.

Rider, R. (2007). Shifting from traditional to nontraditional teaching practices using multiple representations. *Mathematics Teacher, 100*(7), 494-500.

Other Literature Consulted

Burkey, L., Gove, M. K., Lenhart, L. A., McKeon, C., Vacca, J. L., & Vacca, R. T. (2003). *Reading and learning to read*. Boston, MA: Pearson Education, Inc.

Chapin, S. H., & Johnson, A. (2006). *Math matters: Understanding the math you teach, grades K-8* (2nd ed.). Sausalito, CA: Math Solutions Publications.

Dugdale, S., Guerrero, S., & Walker, N. (2004). Technology in support of middle grade mathematics: What have we learned? *Journal of Computers in Mathematics and Science Teaching, 23*(1), 5-20.

Ellerman, T. B. (1998). A study of calculator usage on the mathematics achievement of seventh- and eighth-grade students and on attitudes of students and teaches (Doctoral dissertation, Louisiana Tech University, 1998). *Dissertation Abstracts International, 59*, 1101A.

Fahsl, A. (2007). Mathematics accommodations for all students. *Intervention in School and Clinic, 42*(4), 198-203.

Glover, M. A. (1991). The effect of the handheld calculators on the computation and problem-solving achievement of students with learning disabilities (Doctoral dissertation, State University of new York at Buffalo, 1991). *Dissertation Abstracts International, 52*, 3888A.

Jones, K. (2005). Graphing calculators in the teaching and learning of mathematics: A research bibliography. *Micromath*, *21*(2), 31-33.

Kirk, L. R. (2001) Learning to read: Painful mystery or joyful success? *Journal of Adolescent & Adult Literacy, 44*(5), 420-430.

Mills, G. E. (2007). *Action research: A guide for the teacher researcher* (3rd ed.). Upper Saddle River, NJ: Pearson Education, Inc.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: Author.

Roberts, D. M. (1980). The impact of electronic calculators on educational performance. *Review of Educational Research, 50*(1), 71-98.

Texas Instruments U.S.A. (2003). *TI-83 Plus graphing calculator guidebook*. Menasha, WI: Banta Book Group.

Vasquez, S. (2003). Developmental mathematics students: Investigating calculator keystroke choices to learn mathematical rules and concepts. *Mathematics and Computer Education, 37*(3), 296-300.

Appendix A

Student Survey
Pre-research Analysis

1. Do you have unlimited access to calculators during mathematics instruction?

2. I can understand the lesson better when I use a calculator during mathematical investigations.

3. Mathematics is more interesting and exciting when I use a calculator.

4. Do students who use calculators have an unfair advantage over students who do not use calculators?

5. My teacher decides when a calculator should be used to solve math problems.

6. What do you use your calculator for in the mathematics class? Be specific.

7. Should all students have access to calculators during mathematics instruction?

8. Do you have math homework?

9. Do you have access to a calculator at home?

10. If you had a calculator at home, would you complete your homework?

11. When homework is given, do you complete it even if you do not need a calculator?

12. Why should calculators be available for use in the mathematics classroom?

13. Looking at the face of the calculator, what keys do you use often?

14. Do you participate in a math tutoring program?

15. What is your current grade in Algebra I?

16. Be honest. Should your grade be higher, lower, or is it right on target?

17. Are you happy with your current grade?

18. What is your greatest struggle in your math class?

19. Is the calculator you currently use in your math class difficult for you? Why or why not?

20. Do you think you could do better in class with a different calculator? Why or why not?

Appendix B

Homework Booklet

Homework Assignment #1

Code Name_____________

Date____________________

Use the calculator attached and record every button you would use to solve this problem. After Spring Break we will use our calculators to finish. Thanks for your help. Mrs. Jackson

Simplify each expression below.

1. $(3 + 2) – 10/2 =$

2. $5 + 6 – 3 + 5 =$

3. $10/2 – 5 =$

4. $4^4/2 – 10 =$

5. $(5 + 6)^2 – 3 =$

Homework Booklet

Homework Assignment #2

Code Name____________

Date__________________

Use the calculator attached and record every button you would use to solve this problem. After Spring Break we will use our calculators to finish. Thanks for your help. Mrs. Jackson

Solve the following expressions.

1. $5x - 20 = 100$

2. $7x + 7 = 70$

3. $x/6 = 15$

4. $15 - 4x = 25$

5. $3x - 9 = 10$

Homework Booklet

Homework Assignment #3

Code Name____________

Date__________________

Use the calculator attached and record every button you would use to solve this problem. After Spring Break we will use our calculators to finish. Thanks for your help. Mrs. Jackson

Solve.

1. Chuqueisha earns $7.50 each hour that she works. How many hours will she have to work to buy a dress for $50.00?

2. Mr. & Mrs. Jackson ate dinner at a restaurant and their bill totaled $56.25. They left a 20% tip. How much did they leave for a tip?

3. Angel's net pay last month was $450.50. She had $84.60 withheld from her pay. What was her gross pay?

4. Jarvis earns $8.50 an hour at work. Write an algebraic expression that shows the amount of money *E* that Jarvis earns in *h* hours.

5. Antoine, Ashleigh and Calvin are attending the Black College Festival. The cost of admission is $5.00 for the first 5 hours and $2.00 for each additional half hour. If the students stay at the Festival for 7 hours, how much will it cost each student?

Homework Booklet

Homework Assignment #4

Code Name____________

Date__________________

Use the calculator attached and record every button you would use to solve this problem. After Spring Break we will use our calculators to finish. Thanks for your help. Mrs. Jackson

1. Evaluate 3 to the sixth power.

2. Evaluate 2 to the fifth power.

3. Solve 3/8 x 8/7.

4. Find the next two terms of each sequence.

    2, 4, 6, 8, 16, 32, ____, _____

5. Write the power as a product.

    4(4)(4)(4)(4)(4)

Homework Booklet

Homework Assignment #5

Code Name____________

Date__________________

Use the calculator attached and record every button you would use to solve this problem. After Spring Break we will use our calculators to finish. Thanks for your help. Mrs. Jackson

1. Use the nth term to list the first five terms of the sequence.

   $a_n = 3n + 5 = 8$

   $a_1 =$ _____________

   $a_2 =$ _____________

   $a_3 =$ _____________

   $a_4 =$ _____________

   $a_5 =$ _____________

2. Write the product as a power.

   3^9

3. Find the 10^{th} term of $(4n – 1)$.

4. Evaluate $2r + 8$ when $r = 12$.

5. Evaluate $t/100$ when $t = 5$.

Appendix C

8th Grade Algebra I
Pre-test/Post-test

Directions: Circle the letter of the correct answer for each multiple choice question.

1) Simplify $3^4 - (2 + 6) + 5$.

   a) 74
   b) 88
   c) 98
   d) 79

2) Find the tenth term in the sequence below.
   {9, 18, 27, . . .}

   a) 90
   b) 95
   c) 80
   d) 85

3) Solve $5x - 15 = 40$.

   a) 10
   b) 11
   c) 12
   d) 13

4) Which number represents a_4? When $a_4 = 3n + 4$.

   a) 12
   b) 16
   c) 7
   d) 13

5) Joan earns $10.50 each hour that she works. How many hours will she have to work to buy a dress for $63.00?

   a) 7
   b) 6
   c) 5
   d) 0

6) A couple ate dinner at a restaurant and their bill totaled \$65.85. They left a 20% tip. How much did they leave for a tip?

a) \$13.17
b) \$15.13
c) \$17.13
d) \$13.00

7) Algebraically determine whether 67 is a solution of the equation $3x – 45 = 156$.

a) yes
b) no

8) Jane’s net pay last month was \$370.60. She had \$174.40 withheld from her pay. What was her gross pay?

a) \$500.00
b) \$545.00
c) \$370.60
d) \$455.00

9) Jake earns \$7.75 an hour at work. Which algebraic equation shows the amount of money *E* that Jake earns in *n* hours?

a) $E = 7.75n$
b) $E = 7.75 + n$
c) $n = 7.75E$
d) $n = 7.75 + n$

10) A parking garage charges \$2.25 for the first hour of parking and \$1.50 for each additional hour. If Judy parks for 3 hours, how much will it cost her?

a) \$5.75
b) \$5.25
c) \$6.75
d) \$4.50

11) The GCF of 10 and 20 is _____.

a) 2
b) 10
c) 4
d) 5

12) The LCM of 10 and 20 is _____.

a) 5
b) 1
c) 10
d) 2

13) What is the solution for this equation? -2x + 9 = -17

a. x = -13
b. x = -4
c. x = 4
d. x = 13

14) Solve 4/5 x 5/4.

a. 0
b. 1
c. 2
d. 3

15) Evaluate 2 to the fifth power.

a. ten
b. thirty-six
c. thirty-two
d. twenty

16) What is the student population at Eastern University if there are 750 freshmen, 825 sophomores, 978 juniors, 634 seniors and 124 faculty members?

a) 3,311
b) 3,196
c) 3,187
d) 3,178

17) When is this statement true? The product of two integers is positive.

a) This statement is never true.
b) This statement is always true.
c) This statement is true for the product of a positive and a negative integer.
d) This statement is true for the product of two negative integers.

18) Dominique charges \$6 an hour when she babysits. Which equation shows the relationship between the number of hours Dominique babysits *h* and the amount of money she makes *m*?

a) m = h + 6
b) m = 6h
c) m = 6 - h
d) $\frac{h}{m} = 6$

19) The total profit *p* from selling *n* sweatshirts is given by the equation $p = 15n - 30$. If the total profit was \$720, how many sweatshirts were sold?

a) 46
b) 48
c) 50
d) 52

20) To make brown paint, John must mix 4 parts green and 5 parts red. He needs to make 360 gallons of brown paint. How many gallons of red paint will John need?

a) 160 gallons
b) 200 gallons
c) 288 gallons
d) 360 gallons

Appendix D

Student Survey
Post-research Analysis

1. Did you have unlimited access to calculators during mathematics instruction?

2. Did you understand the lesson better when you used a calculator during mathematical investigations?

3. Was mathematics more interesting and exciting when you used a calculator?

4. Did the students who used calculators have an unfair advantage over students who did not use calculators?

5. Did your teacher decide when a calculator should be used to solve math problems?

6. What did you use your calculator for in the mathematics class? Be specific.

7. Should all students have access to calculators during mathematics instruction?

8. Did you have math homework?

9. Did you have access to a calculator at home?

10. If you had a calculator at home, did you complete your homework?

11. When homework was given, did you complete it even if you do not need a calculator?

12. Should calculators be available for use in the mathematics classroom?

13. Looking at the face of the calculator, what keys did you use often?

14. Did you participate in a math tutoring program?

15. What is your current grade in Algebra I?

16. Be honest. Did your grade improve?

17. Were you happy with your current grade?

18. What was your greatest struggle in your math class?

19. Was the calculator used in your math class difficult for you? Why or why not?

20. Do you think you could have done better in class with a different calculator? Why or why not?

Encouraging Boys to Read: Comparing Boys' Responses to Reading During Thematic Teaching to Single-Subject-Based Teaching

Jennifer Johnson

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-115.

Introduction to the Problem

Reading is a very integral part of the educational system. The more fluent a student is in reading, the more a student enjoys reading, and the more successful the student will be during his or her academic career. Research indicates, however, that boys are finding it difficult to enjoy reading. In addition, boys are more often diagnosed with attention disorders such as ADD, ADHD, and Asperger's Syndrome, which makes the task of reading more difficult. As educators, we need to find ways to encourage boys to read, and help them to enjoy all the wonders that literature can provide. Therefore, the purpose of this study is to determine whether the interest rates and engagement rates of boys in the elementary school classroom is lower than that of girls, and if they can increase during thematic instruction.

Review of Literature

Kush and Watkins (1996) conducted a 3-year study on student attitudes toward reading. Their study found that student attitudes consistently declined during the elementary school years. In addition, they noted that girls displayed more positive attitudes toward reading than boys. Much of the educational process is dependant upon the student's ability to read, and comprehend what has been read. Therefore, learning to read, and possessing the desire to read, can make the difference in a student's success in school. Teachers are in a position to ensure that students learn that reading is more than a series of phonics rules to learn; reading is the opportunity to learn more about themselves and the surrounding world (Challenging the gender divide, 2004). Elementary school teachers can help students be successful throughout their educational career by fostering a love for reading.

One theory to help prevent the continual decline in boy's attitudes toward reading is to take an integrative approach to teaching reading. According to Walker (1996), integrative teaching “reflects the interdependent real world, and involves the learner’s body, thoughts, feelings, senses, and intuition in learning experiences that unify knowledge” (p. 2). This can be accomplished by teaching in thematic units. In one article, Ritter (1999) suggests that teaching language arts can be accomplished in thematic units that integrate “broad areas of knowledge, such as social studies, mathematics, or ecology with the teaching of the four major language skills: reading, writing, listening, and speaking” (p. 1). Designing a curriculum around a theme increases the students’ exposure to hands-on learning. This type of discovery learning allows the focus of education to be on the process of learning and gaining knowledge, and less on the rote memorization of facts. It also allows learning to happen in a natural context that is more true to life (Haury, 2002). This learning can help students gain insight into their own heritage, as well as that of others. This insight can increase a student’s self-esteem, thereby increasing his or her success in school (Abdal-Haqq, 1994). Since boys tend to struggle more than girls, academically, and tend to respond to tactile instruction favorably, this integrative approach should help increase boys’ interest and engagement rates at school and in the reading process.

Themes can also be arranged to be more appealing to boys in the classroom. With reading requiring more stillness, an attribute generally associated with girls, and reading material often directed at girls, boys need books that appeal to their natures (Rutledge, 2003). Thematic units can take advantage of this by incorporating themes such as insects, pirates, or outer space to appeal to the boys, but still meet state and local educational standards (School experiments with same-sex reading groups, 2005).

Walker (1996) indicates that knowledge is best stored and retrieved by the brain when the information is “connected to a web of meaning” (p. 2). Arnason, McDonald, Maeers, and Weston (2001) also believe thematic curriculum makes learning relevant to the students, and can increase motivation. Yorks and Follo (1993) used an engagement rate observation form, student self-perceptions, and teacher assessments to indicate that students were more engaged during thematic instruction than during subject-based teaching. While students displayed acceptable engagement rates during traditional, single-subject teaching, engagement rates increased during thematic teaching. The teacher also indicated that the students appeared to be bored during traditional instruction and more excited about learning during thematic instruction. In addition, Yorks and Follo indicated that higher engagement can be a positive indicator of academic achievement. Thus, students who spend more time on a task will display higher academic performance.

Data Collection and Results

Data Collection

Subjects

The subjects of this study are in an urban, public elementary school. The students are in a kindergarten classroom. The class consists of 12 girls and 9 boys. There are 7 African-American, 12 Caucasian, and 2 Hispanic students in the class. Six of the students have not met the benchmarks for reading in state-mandated literacy skills testing. These six students, three boys and three girls, are required to receive an extra 30 minutes of reading instruction per day. Parental permission was obtained for 5 boys and 11 girls to participate in this study. Final analysis is based upon these 16 students.

Gender is a variable in this study. A second variable is the way in which a lesson was taught. Five lessons were taught in the typical manner of the class, with no attempt to link together material. Five additional lessons were taught with a thematic base, attempting to bring all subjects together under a common theme, *The Mitten,* by Jan Brett, which is appropriate for the grade level and can be related to the current math unit on measurement.

Students in the study come from a variety of backgrounds and are at a variety of readiness levels for reading. In addition, students vary in their natural methods of learning, maturity levels, and interests.

Methodology

This study will determine whether the interest rates and engagement rates of boys in the elementary school classroom will increase during thematic instruction. This study will also seek to determine whether a difference in engagement rates is noticeable between boys and girls during the first year of traditional school. Traditional, single-subject instruction methods will be employed to establish a baseline for boys' interest and engagement levels during reading activities. Interest levels will be determined through a student self-evaluation that will be administered by the researcher (see Appendix A). The researcher will read the question and the student will give a verbal answer, which the researcher will indicate on the form. Engagement levels will be determined using the observation form, based on the Engagement Rate Observation Form, published by the Association for Supervision and Curriculum Development (cited in Yorks & Follo, 1993). These baseline levels will be compared to boys' interest and engagement levels during thematic instruction.

Procedure

The study was conducted over a 2-week period. Students were given a survey at the beginning of the research period asking them to indicate their desire to read in different situations (see Appendix A). The class spent 1 week in their typical method of study, which did not make any conscious effort to integrate one subject into another. The teacher kept a list of students who voluntarily visited the classroom library and which books they chose to read. The teacher also kept a list of books checked out during the students' visit to the school library during their related arts period. During reading instruction, an observation log was kept to determine students' engagement during the activity. The form indicated which students were on task, socializing, or uninvolved in the instruction. At the end of the week, the students were asked to fill out a new survey indicating their desire to read, at this point in the study.

Once these tasks were observed during a traditional, single-subject setting, the researcher spent a week incorporating a thematic unit into the classroom. Every effort was made to incorporate all subject areas into the theme. The theme, *The Mitten*, by Jan Brett, was chosen, based on the time of year and the standards outlined in the school system's curriculum map. Books featured in the classroom library dealt with a winter theme. Again, a list was kept by the teacher of those students who voluntarily visited the classroom library, and the books which all students selected to read. The teacher again observed and reported students' engagement levels during literacy instruction. At the end of the unit, the students were asked to complete another survey indicating their desire to read, after thematic instruction.

Results

Data was collected in three forms. Student self-surveys indicated the students' own level of desire to read. This information, gained at the beginning of the study and at the end of each unit, was charted to determine whether the students' desire to read increased during thematic teaching. In addition, the data is separated by gender and charted to determine which gender had a greater desire to read, and whether either gender experienced a rise in desire to read during a thematic unit.

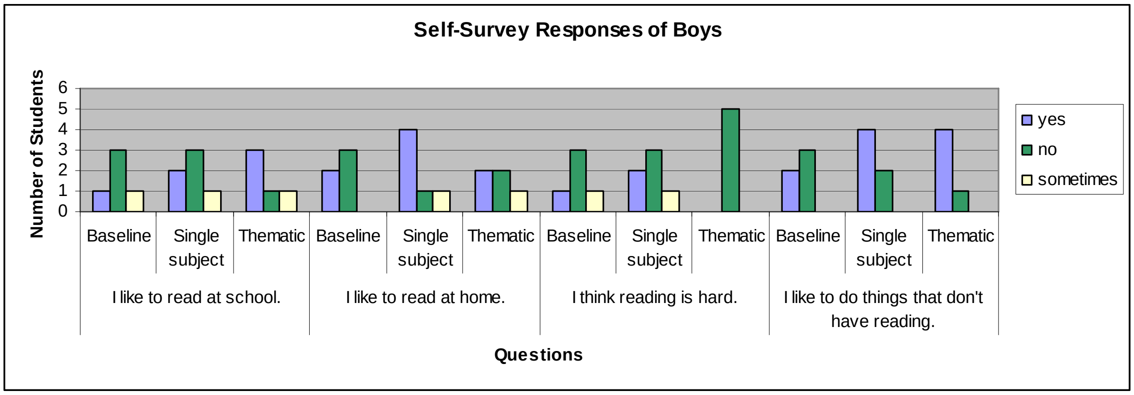


Figure 1. The response of boys from self-surveys.

The data in Figure 1 shows that three out of five, or 60 percent, of the boys began the study indicating that they did not enjoy reading at home or school. Three out of five, or 60 percent, of the boys also indicated that they did not believe reading was a difficult task. In addition, three of the five boys questioned indicated that they would choose to do activities that involve reading. One student, 20 percent of the sample, indicated that he did enjoy reading at school and one student indicated that he thought reading was difficult. Two of the boys, or 40 percent, enjoyed reading at home and two would choose to do activities where reading was not required. For comparison purposes, Figure 2 indicates that 7 of 11 girls, or 64 percent, indicated that they enjoyed reading at school and at home, at the beginning of the study. Only two girls, or 18 percent, found reading to be difficult, and five girls, or 45 percent, would choose to do activities that involved reading.

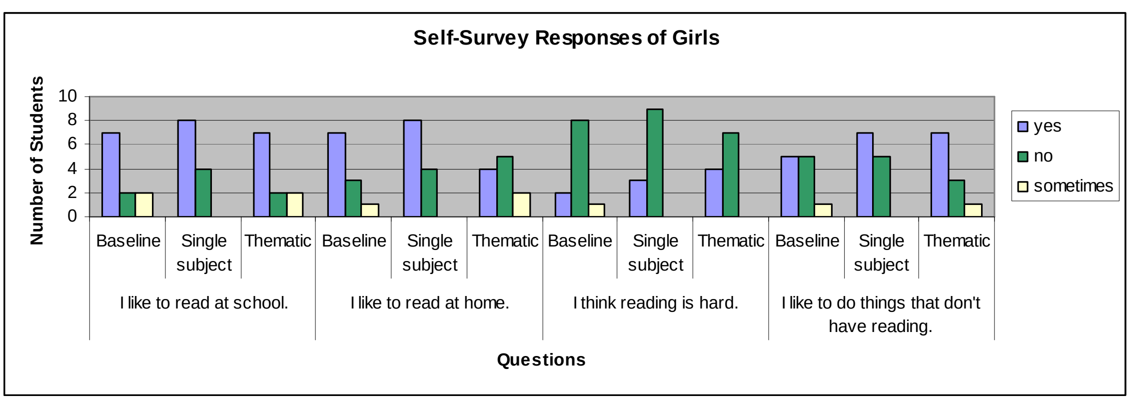


Figure 2. The response of girls from self-surveys.

After the thematic unit had been taught, only one of the boys, or 20 percent, said they still did not enjoy reading at school or at home (See Figure 1). None of the boys felt that reading was hard, but only one student, 20 percent of the sample, would choose to do an activity which required reading. Of the girls surveyed after the thematic unit, seven, or 64 percent, continued to enjoy reading at school but only four, or thirty-six percent, enjoyed reading at home. Four of the girls found reading to be difficult, and seven of the girls would choose to do an activity that did not involve reading.

The second form of data collection is in the form of lists kept by the teacher that indicated which students chose to read during free time, and the books all students chose to read, when required to choose a book. The lists were compared to see whether more students chose to visit the classroom library during thematic units. The teacher also compared lists of books chosen to determine whether or not students were choosing books related to the theme.

The list of books, found in Figure 3, indicates that few of the students, girls or boys, voluntarily visited the reading center when teaching during the traditional, single-subject week. Only three girls and no boys chose to look at books during a free center period. The students chose books located in the general classroom library, which is always available to the students. The list kept during the week of thematic teaching illustrates that only three girls and one boy voluntarily visited the classroom book center. The books were chosen from the general classroom library, and not the collection of thematic books made available to the students. The students were not able to visit the school library during the week of thematic teaching, therefore, there were no conclusive lists of the books students were able to check out of the library to compare between teaching methods.

Students Voluntarily Visiting Classroom Library	Title
During Single-subject Instruction	
111 (girls)	The Tailor of Gloucester
114 (girls)	Wild About Books
211 (girls)	Freshwater Alphabet Book
Students Voluntarily Visiting Classroom Library During Thematic Instruction	Title
111 (girls)	Tale of Benjamin Bunny
211 (girls)	Happy Mother's Day, Mami
216 (girls)	Penguin Pete
112 (boys)	Snakes Are Hunters

Figure 3. Students who voluntarily visited the classroom library during free time.

The third data collection method is from the researcher's personal observations, indicated on the observation form during literacy instruction. This information is charted by gender to determine when boys attained a higher engagement rate in the reading process. During the traditional, single-subject teaching event, the boys were shown to be socializing 23 percent of the time, uninvolved in the instruction 40 percent of the time, and engaged 51 percent of the time. While teaching the thematic unit, the boys were observed to be socializing 14 percent of the time, uninvolved in the instruction 31 percent of the time, and engaged 55 percent of the time. Girls were socializing 24 percent of the time, uninvolved 23 percent of the time, and engaged 53 percent of the time during single-subject literacy instruction. During the thematic unit, girls were socializing 18 percent of the time, uninvolved 19 percent of the time, and engaged 60 percent of the duration of literacy instruction. (See Figures 4-7.)

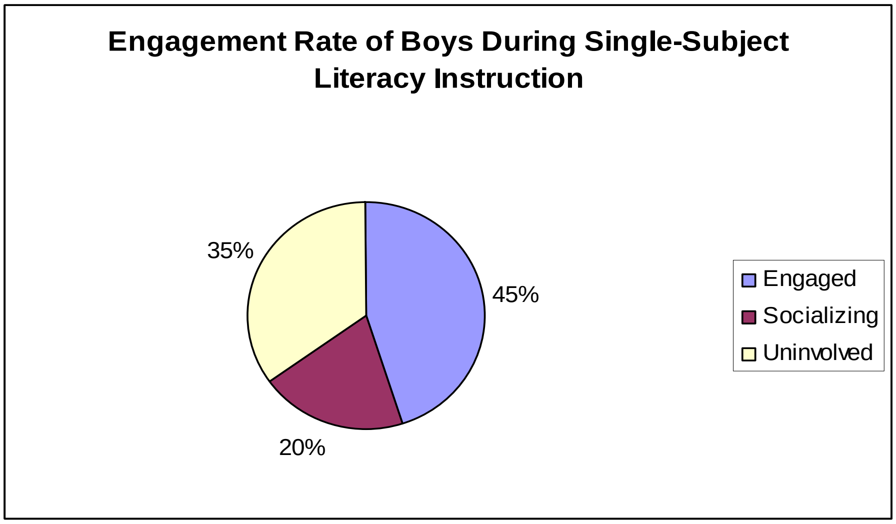


Figure 4. Engagement, socialization, and uninvolved rate of boys during single-subject literacy instruction.

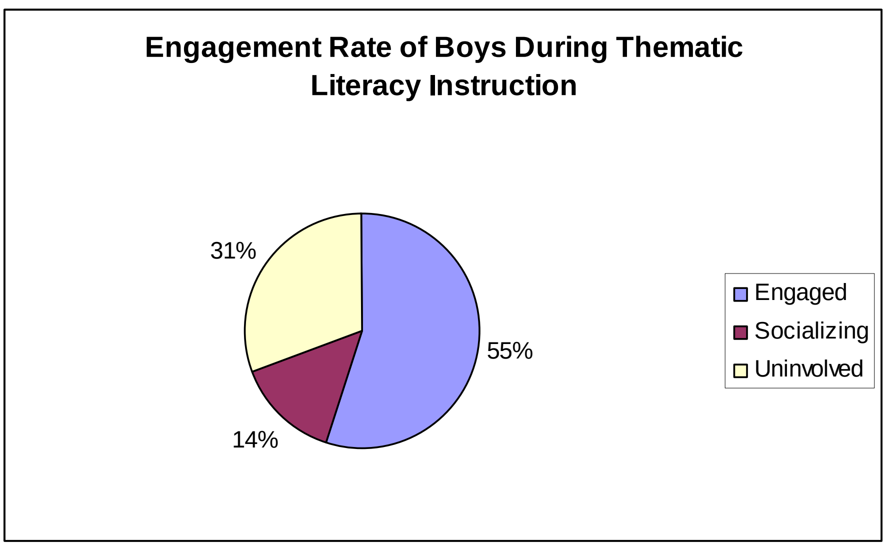


Figure 5. Engagement, socialization, and uninvolved rate of boys during thematic literacy instruction.

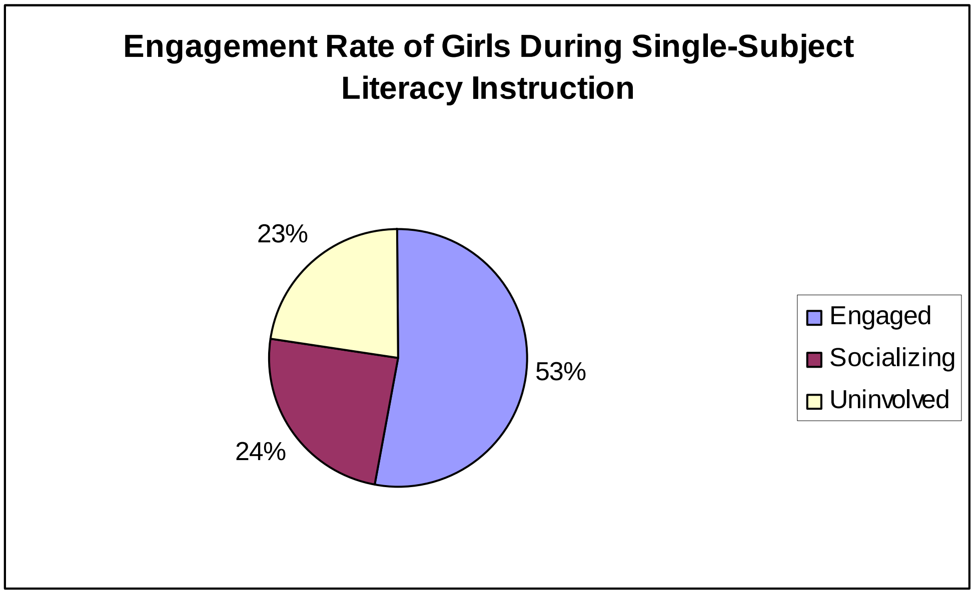


Figure 6. Engagement, socialization, and uninvolved rate of girls during single-subject literacy instruction.

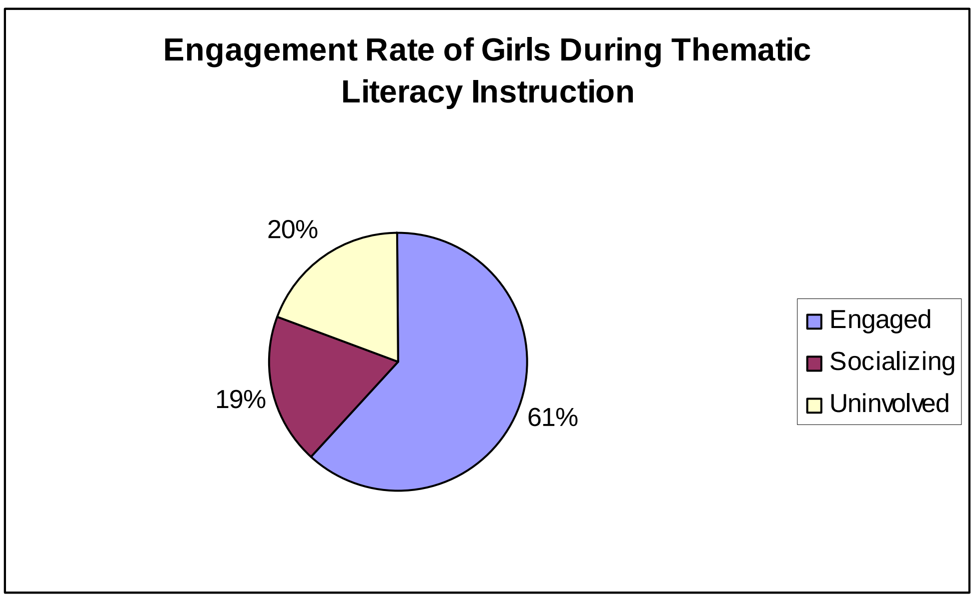


Figure 7. Engagement, socialization, and uninvolved rate of girls during thematic literacy instruction.

Conclusions and Recommendations

Conclusions

Based on the data collected during this study, it can be concluded that there is a difference in boys' and girls' attitudes toward literacy. Boys are less likely to express enjoyment of reading at home or at school, and are consistently less engaged in literacy instruction. The most positive impact of thematic teaching can be observed in the boys' surveys where they indicated an increase in positive attitudes toward reading at school. It is important to note that an increase in positive attitude toward an activity increases the likelihood that the student will continue the activity, and benefit from its continuance. In this case, having a positive feeling about reading may cause the students to continue to read, which may help them to be more successful in their future school endeavors.

The results of this study also indicate that thematic teaching had a positive, yet minimal, effect on boys' engagement rates during literacy instruction. Engagement rates for boys increased from 45 percent to 55 percent engaged during thematic instruction. Girls also recognized an increase in engagement, from 53 percent to 61 percent, during thematic instruction. This finding is important because the attempt to reach boys did not seem to adversely affect girls.

One area that showed no impact from thematic teaching was the boys voluntarily choosing to read a book from the classroom library. The culture of the classroom or maturity level of the students, as opposed to the teaching method utilized, may have more impact on why so few students, regardless of gender, chose to visit the classroom library. While a few girls and one boy did chose to read during the study, their visits were minimal and brief. The students, generally, chose activities that incorporated manipulatives over books.

Recommendations

This study, while informative, is inconclusive. The results are based on a small sample of students during a relatively short period of experience with thematic teaching. While this study resulted in some positive indications that thematic teaching may be beneficial to encouraging reading in boys, it was unable to produce a dramatic increase in boys' engagement during literacy instruction or in boys' desire to choose reading for pleasure.

It would be beneficial to conduct this study for an extended period of time to determine whether continued exposure to thematic teaching exponentially increased boys' engagement in literacy and overall attitude toward reading. By extending the duration of the action research, the researcher would learn more about the students in the sample, and would be able to tailor themes to the students' needs and interests. In addition, the researcher would be able to look at long-term retention rates, as well as the ability to comprehend what the student has read. Further study could also be done to ensure that steps taken to encourage boys in reading do not have a detrimental effect on girls' engagement in reading.

Professional development opportunities would also increase the validity of extending this study. By allowing teachers to collaborate, they may develop a plan for integrating subject matter to meet state and local standards, as well as the needs and interests of students. Teachers also need to be given access to the research, which indicates the benefits of cross-curricular, thematic instruction on students' retention of information.

The reading skills of all students are important to the success of the public school system. It is the recommendation of this study that additional research be done to fully determine the effects of thematic instruction on boys' engagement during reading, and to continue to encourage boys to read.

References

Abdal-Haqq, I. (1994). *Culturally responsive curriculum*. (ERIC Document Reproduction Service No. ED370936)

Arnason, K., McDonald, J., Maeers, M., & Weston, J. (2001). *Interweaving mathematics and indigenous cultures*. Retrieved April 19, 2008, from http://MathCentral.uregina.ca/papers/interweaving.html

Challenging the gender divide: Improving literacy for all. (2004). *Teacher Librarian*, *32*(2), 8-11.

Haury, D. (2002). *Learning science through design*. (ERIC Document Reproduction Service No. ED478715)

Kush, J., & Watkins, M. (1996). Long-term stability of children's attitudes toward reading. *Journal of Educational Research.* Retrieved April 19, 2008, from http://vnweb.hwwilsonweb.com.proxy.lib.utc.edu/hww/results/results_single_fulltext.jhtml

Ritter, N. (1999). *Teaching interdisciplinary thematic units in language arts.* (ERIC Document Reproduction Service No. ED436003)

Rutledge, D. (2003). Boys and girls together. *Education Canada*, *43*(2), 48.

School experiments with same-sex reading groups. (2005). *Curriculum Review*, *44*(8), 8.

Yorks, P. M., & Follo, E. J. (1993). *Engagement rates during thematic and traditional instruction*. (ERIC Document Reproduction Service No. ED363412)

Walker, D. (1996). *Integrative education.* (ERIC Document Reproduction Service No. ED390112)

Appendix A

Let's Read!

1. I like to read in school.	No	Sometimes	Yes
2. I like to read at home.	No	Sometimes	Yes
3. I think reading is hard.	No	Sometimes	Yes
4. I like to do things that don't have any reading.	No	Sometimes	Yes

Let's Read!

1. I like to read in school.	No	Sometimes	Yes
2. I like to read at home.	No	Sometimes	Yes
3. I think reading is hard.	No	Sometimes	Yes
4. I like to do things that don't have any reading.	No	Sometimes	Yes

Arts-Based Spelling Strategies

Nicole Brewer Lantman

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-109.

Introduction to the Problem

One of the Tennessee Department of Education (n.d.) teacher licensure standards is to demonstrate an understanding of how to "teach word identification strategies, assist students in building their vocabularies, and guide students in refining their spelling" (p. 244, 37-3). Spelling is a vital part of student literacy, but is often taught as a separate subject, with little or no regard to correct usage or retention.

In 2005, the researcher began tutoring a struggling student who had recently been diagnosed with dyslexia. Her teacher informed the child's mother that she would likely "get by" that academic school year, but she would struggle in the next grade if no intervention took place. The teacher spoke specifically about the child's poor writing. At the first meeting with the student, the researcher spoke with the student about her writing. The researcher noticed immediately that the young girl was very reluctant to write. She stated, "I am not good at it." When asked specifically what she felt was the hardest part of writing, she reported it was her spelling. Her mother seemed confused because the child had never scored less than a B on weekly tests. The student also reported that she was not a good reader. She claimed to be very nervous during "round-robin" reading for fear of not being able to watch a movie at the end of the week, if she stumbled over words. The researcher discovered that she, like many other students, could memorize the words short-term, but did not retain them, did not use them in writing, and did not recognize the words in her reading. Her grades in spelling were great, but it was evident, after reading her writing samples, that she lacked spelling proficiency and consistency. Furthermore, the student could not correctly spell the spelling words several days after the assessment. In some cases, the student had no idea what the word meant. The researcher believes that spelling and vocabulary should be taught together.

Most of the research concerning spelling is dedicated to those that argue for or against inventive spelling. While there is research on linking arts with literacy, there is very little research on spelling and the arts; however, many books on spelling activities have been written. One high school teacher commented that inventive spelling has created the worst spelling students in her 30 years of teaching. Other teachers argue that inventive spelling allows students to freely write, and that all writing starts as a “draft.” In either case, it must be argued that there must be a stage in which students become more proficient spellers, and do not simply, “spell how it sounds.” Hopefully, the arts-based spelling strategies can help students learn difficult words, and those that are exceptions to the rules. The researcher could find no actual research that using these activities had a positive or negative impact on spelling grades.

Area of Focus Statement

Many students claim to be visual learners, and connect with learning materials that rely on a more hands-on learning approach. Most students today have used inventive spelling during literacy development. It is a common debate that this practice has produced terrible spellers later in their academic career. The purpose of this investigation is to determine if arts-based spelling strategies improve spelling scores.

Limitations

The single, biggest limitation that exists for this study is time. Since this project will be completed during a student teaching internship, the maximum amount of time from start to finish will be 8 weeks. Two weeks of actual “lessons” will be taught, and data collected. While spelling is a vital part to literacy, it is given a small block of time each day. Some work may have to be completed at home, thus affecting student attitude. Another limitation for this study will be whether the student and parents are honest with the surveys. Some students want to please the researcher by giving what he or she perceives as the “correct” response. The researcher will be new to the classroom, and will not have a long-term relationship with the students or understanding of individual work habits. A final, possible limitation is the cooperating teacher’s willingness to allow students to abandon the traditional spelling lessons.

Research Questions

- Does using arts-based spelling strategies improve test scores?
- What type of impact do arts-based strategies have on student attitudes toward spelling lessons?
- Which strategies do students feel are most helpful in learning their weekly spelling lists?

Review of Literature

Traditionally, spelling lessons are taught as a separate subject. Little, if any, emphasis is placed on meaning of the word or how to properly use the word in writing. Most spelling research is dedicated to debates regarding the use of inventive spelling or inventive spelling’s proper place in spelling development. Although much research has been done about how using art can help students in other literacy disciplines, little research has been done, specifically, with spelling and the arts.

Groff (2004) reports that, when students do not know how to spell a word when writing, most teachers give the students several options. First, they can look it up in a dictionary. Another option is ask a classmate for help. Students also have the option to leave the space blank, continue writing, and fill in the word later. More commonly, the teacher says they can (a) spell the word phonetically, or (b) invent an idiosyncratic spelling for the word. He contends that most teachers encourage students to spell the word phonetically, i.e., apply their knowledge of speech and letter relationships to its spelling.

Thibodeau (2002) warns that educators should be careful not to give the impression that spelling does not “count.” She suggests for teachers to “develop an awareness of the importance of correct spelling in effective communication” (p. 20). In today’s world of technology, tools such as spell check, and others, can greatly help students, but we must reinforce that these are tools. Proper spelling is a key component of literacy. As Chandler (2000) found in a survey, 15 to 20 percent of the students cited “their poor spelling as a primary reason why they hated or refused to write” (p. 87). It is a very fine line. On one hand, educators want students to feel safe enough to read and write, and that learning is a process; but on the other hand, we do not want them to feel like learning how to spell correctly is not important.

Gentry (2000) says, “Today, encouragement of invented spelling for young developing writers is considered good teaching practice” (¶ 2). In contrast, Templeton and Morris (1999) discuss the concerns of school systems that spelling on standardized tests is poorer than in previous years. They further report that both parents and teachers are concerned that invented spelling could lead to a “lifetime of poor spelling” (p. 102). They believe inventive spelling is to blame. Kolodziej (2005) reminds readers of her article that spelling mastery, taught in any way, must develop over time. She believes that inventive spelling has a place in literacy development, and that it should be used as a tool, not a crutch. She encourages teachers to inform parents of the positive benefits that are associated with invented spelling; that would be instrumental. She further suggests that teachers show the progression toward mastery in writing samples. Chandler-Olcott and Gibson (2004) reported that, in a survey given to parents, they indicated that of the parents’ most important goals for their child’s education, only 2 goals in the top 10 were related to academics. They were to be able to learn to write clearly and to be able to spell correctly.

According to Sipe, Walsh, Nordwall, Putnam, and Roswarne (2002), about one half of challenged spellers demonstrate substantial difficulty with short- and long-term memory. Since traditional spelling practices rely on visual-based memorization, the researchers suggest that teachers should include strategies that are auditory, kinesthetic, and meaning-based. Most students tend to like art projects and classes. Unfortunately, little, if any, time in many schools is dedicated to the visual and performing arts. Cowan & Albers (2006) report that, “the link between the arts and literacy is commanding more attention in recent literacy research” (¶ 3).

Chandler (2000) states that, in an investigation into why students are reluctant to write, 15 to 20 percent cited poor spelling as the primary reason they hated or refused to write. She further states that students think of spelling as arbitrary and whimsical, and were more likely to give up when faced with spelling challenges. Yule’s (1986) study argued that, “English spelling has always been recognized as a burden for most young learners unless they have good visual memories” (p. 279). She further states that problems spelling only intensify for students with learning disabilities, especially those with dyslexia. Lastly, she contends that, “few teachers are taught how to understand the spelling system themselves” (p. 281).

In her book, Granske (2000) states that, “although having many opportunities to read and write is essential for spelling development, for most students it is not sufficient” (p. 4). She contends a more guided approach is needed. She goes on to say that “even students who seem to have a natural knack for spelling benefit from and are stimulated by developing appropriate activities that are within their ‘zone of proximal development’ as Vygotsky would say” (p. 6).

One thing most researchers concur is that students’ spelling develops in stages over time. Wilde (2004) says, “The most important research about spelling comes from the many studies that examine children’s development as spellers as they gain increasing experience with written language" (¶ 4). She goes on to say that, by the fourth grade, the average student will spell about 92 percent of words correctly, according to the National Assessment of Educational Progress Writing Report Card.

Another point most researchers agree about is the more reading a student does, the more proficient he or she becomes with spelling. Koblitz (2004) says, "There is a strong connection between time spent reading independently and increased spelling knowledge; every minute students spend reading is a minute they have spent studying spelling" (p. 3). Wilde (1996) agrees, and believes that the greatest single factor in spelling acquisition is reading.

While there is much debate on whether inventive spelling is good practice or not, one thing is certain: researchers are looking for best practices. Kolodziej (2005) boldly says, "As evidenced by the knowledge base of research, invented spelling is developmentally based and children who use invented spelling will eventually become conventional spellers" (p. 220). She goes on to say, "In addition, children's use of invented spelling has been found to increase academic achievement in areas of spelling, writing, and reading" (p. 220). This debate will likely not be settled any time soon. Many more tools are available for students today; we must make sure these tools do not become a crutch. Fortunately, reading is thought to be the best tool for spelling acquisition. What a wonderful tool!

Data Collection and Results

Data Collection

The researcher will use both quantitative and qualitative data. First, the researcher will use archival records of previous spelling scores. The first survey (see Appendix A) asks what the student's spelling average currently is. Pre-tests and post-tests (see Appendices B and C) will be administered for each week. The researcher will participate as an active observer, noting student participation, as well as attitudes. Field notes will be taken for the 2-week study. A post-intervention survey will also be completed by each student. Finally, a cooperating teacher survey will be administered to limit any researcher bias.

Subjects

Participants for this study will consist of 21 students in a fourth-grade class at a suburban, elementary school in Hamilton County, Tennessee. The school has approximately 300 students, and is made up of a variety of socioeconomic classes, as well as a variety of ethnicities.

Methodology

Intervention

This study will be divided into 2 separate weeks of investigation. During week one, the pre-survey and pre-tests will be administered. No other changes in the classroom instruction will take place. Students will complete spelling assignments exactly as they have done prior to the researcher’s placement.

During the second week of the study, the pre-test will be identical to that administered in week one. The main intervention takes place during week two. The researcher will change the lessons from traditional spelling lessons to arts-based lessons, consisting of rainbow words, word association pictures, silly stories, poetry, music, and charades, as well as discussing word attack skills, patterns, and rules.

The first lesson will be “Rainbow Words” (see Appendix E). Students will create a rainbow on a large piece of art paper using his or her spelling words. The student will write each spelling word with red, orange, yellow, green, blue, and purple. Students will be encouraged to be as creative as possible in completing the assignment. An example of a completed piece will be available for students to view.

The second lesson will be “Word Association Pictures” (see Appendix F). Students will draw a picture to represent each spelling word. The researcher will instruct students to draw whatever comes to mind when they hear the word. Then, using colored pencils, students will color the “Word Association Pictures” and label them with the spelling word that corresponds to that picture.

The third lesson will be “Silly Stories” (see Appendix G). Students will create a story using the given spelling words. Students will be encouraged to make the stories silly or funny, but will be instructed to use the word in proper context. All spelling words will be used in the story. The researcher will also reinforce proper writing mechanics. The researcher will use enlarged, writing sample examples to introduce the lesson.

The fourth lesson will be “Spelling Word Poems” (see Appendix H). Students will create a poem using all of the spelling words. The researcher will instruct students to write a poem using all spelling words. Students will then share his/her poem with the rest of the class.

The researcher will administer the post-test and post-surveys after week two has been completed (see Appendix I). Finally, a post-intervention survey (see Appendix D) will be given to compare student attitudes of traditional versus arts-based lessons.

Results

The trend for the arts-based lessons is very positive. Students not only enjoyed doing the activities, but also scored better than during the traditional week. Additionally, the pre-test scores were lower the second week, but students scored higher on the post-test.

During week one (traditional), the pre-test mean was 70.7 percent. The post-test mean was 91.4 percent. The mode of the pre-test was 60 percent, while the mode of the post-test was 95 percent. The median of the pre-test was 70 percent, and the median of the post-test was 95 percent (See Figure 3).

During week two (intervention), the pre-test mean was 64.2 percent, while the post-test mean was 94.5 percent. Therefore, one cannot assume that the test given during week two must have been an easier test, since the pre-test scores were lower. The mode of the pre-test was 70 percent, while post-test mode was 100. Ironically, the median of the pre-test was 70 percent, and post-test median was 100, the same as the modes. Results are displayed in Figures 1 through 4.

In the pre-intervention survey (see Appendix A), students listed that the reason they did not like spelling as it is boring. On the post-intervention survey (see Appendix D), every student reported they enjoyed the art week over the traditional week. In addition, the “Rainbow Words” and the “Word Association Pictures” lessons were favorites. Of the arts-based lessons, students listed the poems as the least favorite arts-based lesson. They cited it was the hardest to do. The teacher stated they had only written poems twice this school year.

Spelling Week 1 - Traditional Week

Student #	Pre-test score	Post-test score
1	95	100
2	80	80
3	50	95
4	60	85
5	80	95
6	70	90
7	65	100
8	70	100
9	85	95
10	60	55
11	65	100
12	70	95
13	65	100
14	60	100
15	60	75
16	75	95
17	90	95
18	75	90
19	60	95
20	80	85
21	70	95

Figure 1. Week 1 test results.

Spelling Week 2 - Intervention

Student #	Pre-test score	Post-test score
1	90	100
2	85	90
3	60	100
4	30	90
5	95	100
6	65	100
7	70	100
8	70	100
9	85	95
10	10	80
11	80	100
12	55	90
13	50	100
14	60	100
15	30	70
16	55	95
17	85	100
18	60	95
19	70	100
20	75	80
21	70	100

Figure 2. Week 2 test results.

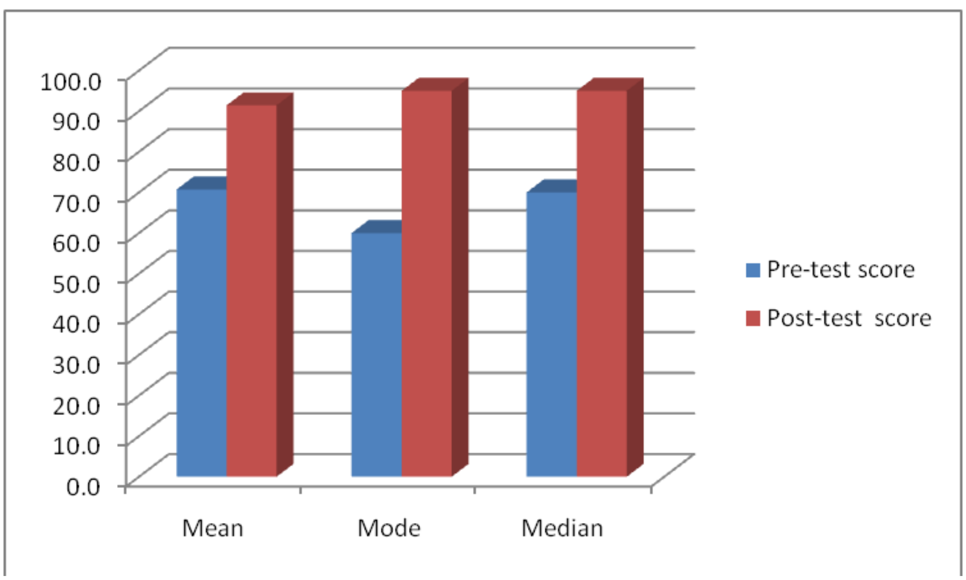


Figure 3. Week 1 statistical values.

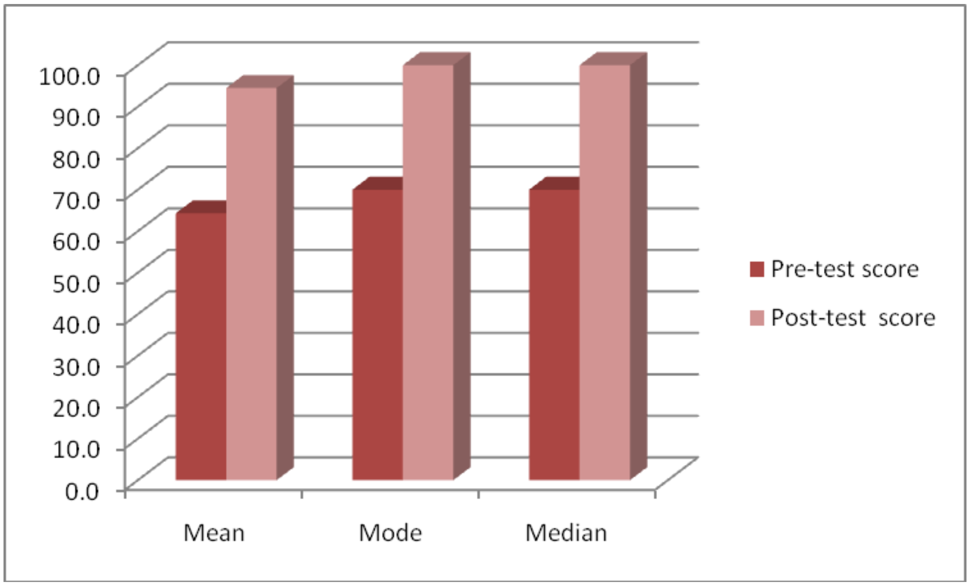


Figure 4. Week 2 statistical values.

Conclusions and Recommendations

Students preferred the arts-based lessons over the traditional lessons. One might infer that the students responded better to the arts-based lessons because they were, simply, something different than what they are used to doing. Students in this class seemed to enjoy art in general, so this class may be more inclined to enjoy arts-based assignments. Much more time would be needed to determine if these lessons are more effective than traditional spelling lessons.

In meeting with the principal, the cooperating teacher, and a group of teachers studying Granske's book, *Word Journeys: Assessment-Guided Phonics, Spelling, and Vocabulary Instruction*, the consensus is that students enjoy the arts-based lessons much more than traditional lessons. Several teachers have implemented several of the lessons to go along with their spelling lessons. While one could not surmise that arts-based spelling strategies were more effective, everyone agreed the lessons were less boring and kept the students more engaged.

I would recommend that teachers collaborate to implement different arts-based spelling assignments in the classroom. A wonderful teacher professional development workshop could be designed to give examples of arts-based lessons, and to brainstorm new arts-based strategies.

Grant money is available to support further research in this area. In particular, monies are widely available for ELL students, and students with learning disabilities, including dyslexia. Research indicates that students with dyslexia could benefit from these arts-based spelling lessons. Additionally, one of the students, who had been diagnosed with Asperger’s Syndrome, usually turned in very few assignments, rarely completing any spelling assignments, but turned in every arts-based spelling assignment.

Computers could play a huge role could in the execution of these lessons. Students could draft silly stories and poems with paper and pencil, and publish final drafts using word processing software. Spell check could be used to help students identify problem words, and help refine spelling.

References

Chandler, K. (2000). What I wish I'd known about teaching spelling. *English Journal, 89*(6), 87-95.

Chandler-Olcott, K., & Gibson, G. (2004). The pal in principal: Leadership that promotes spelling development in elementary schools. *National Council of Teachers in English, 9*(2), 4-6.

Cowan, K., & Albers, P. (2006). Semiotic representations: Building complex literacy practices through the arts. *The Reading Teacher, 60*(2), 124-137.

Gentry, J. (2000). A retrospective on invented spelling and a look forward. *The Reading Teacher, 54*(3), 318-332.

Granske, K. (2000) *Word journeys: Assessment-guided phonics, spelling, and vocabulary instruction*. New York: The Guilford Press.

Groff, P. (2004). A critique of inventive spelling. *National Council of Teachers in English, 9*(2), 1-2.

Kolodziej, N. (2005). Invented spelling: Guidelines for parents. *Reading Improvement, 42*(4), 212-223.

Koblitz, D. (2004). Learning to spell all day long. *National Council of Teachers in English*, *9*(2), 3-4.

Sipe, R., Walsh, J., Nordwall, K., Putnam, D., & Roswarne, T. (2002). Supporting challenged spellers. *Voices from the Middle*, *9*(3), 23-32.

Thibodeau, G. (2002). Spellbound: Commitment to correctness. *Voices from the Middle*, *9*(3), 19-22.

Templeton, S., & Morris, D. (1999). Questions teachers ask about spelling. *Reading Research*

Quarterly, 34(1), 102-112.

Tennessee Department of Education. (n.d.). *Tennessee licensure standards and induction guidelines*. Retrieved April 29, 2008, from http://www.tennessee.gov/education/lic/doc/accttchlicstds.pdf

Wilde, S. (1996). A speller's bill of rights. *Primary Voices K-6, 4*(4), 22-38.

Wilde, S. (2004). Spelling: What we still worry about. *National Council of Teachers in English*, *9*(2), 1-2.

Yule, V. (1986). The design of spelling to match needs and abilities. *Harvard Educational Review*, *56*(3), 278-296.

Appendix A

Spelling Lessons Survey

1. What do you like most about your spelling lessons now?

2. What do you like least about spelling lessons?

3. Do you think spelling is hard or easy?

4. Why? (Refer to question 3)

5. What is your average spelling grade?

Student # ___________

Appendix B

Spelling List

Week 1

1. shark
2. attack
3. risk
4. public
5. sink
6. question
7. electric
8. jacket
9. blank
10. ache
11. crooked
12. drink
13. topic
14. track
15. blanket
16. struck
17. mistake
18. junk
19. squirrel
20. stomach

Appendix C

Spelling List

Week 2

1. beauty
2. ugly
3. lazy
4. marry
5. ready
6. sorry
7. empty
8. honey
9. valley
10. movie
11. duty
12. hungry
13. lonely
14. alley
15. body
16. twenty
17. turkey
18. hockey
19. fifty
20. monkey

Appendix D

Post-intervention Survey

1. Which week of spelling lessons do you like best? Why?

2. Which activity did you like best?

3. Why did you like that activity?

4. Which activity did you like least?

5. Why didn't you like that activity?

6. What was your spelling test grade week 1?

7. What was your spelling test grade week 2?

Student #_________

Appendix E

Lesson 1

"Spelling Rainbow Words"

SUBJECT: Spelling

GRADE: 4th

TIME/DURATION: 1 class period

GOALS/STANDARDS(s): See Tennessee Fourth Grade Spelling Standards

OBJECTIVES:
Students will create a rainbow of spelling words writing each word in red, orange, yellow, green, blue and purple.

INTRODUCTION/ANTICIPATORY SET/ADVANCE ORGANIZER:
The student teacher will display sample of the rainbow words example poster the student teacher collected during a case study. The student teacher will say, "Today, you will create your own rainbow, using your twenty spelling words."

LESSON SEQUENCE:

- The student teacher will display the giant poster of rainbow spelling words
- The students will write their spelling words using red, orange, yellow, green, blue and purple markers or colored pencils.

CLOSURE:
The student teacher will allow students to draw additional illustrations around their picture and display each student's artwork.

PRACTICE, REMEDIATION AND ENRICHMENT ACTIVITIES:
The students will take spelling lists home tow practice their spelling words at home.

INSTRUCTIONAL MATERIALS/RESOURCES/EQUIPMENT:
Spelling lists Pencils, Art Paper, Markers, Colored pencils, "Rainbow Words Poster"

DIVERSITY ACCOMMODATIONS:
Diversity Accommodations will be made per student IEP. Students will be paired so that peer tutors can be utilized.

ASSESSMENT/EVALUATION:
The student teacher will evaluate pictures to determine if students correctly spelled the spelling words using red, orange, yellow, green, blue, and purple.

Appendix F

Lesson 2

"Spelling Word Association Pictures"

SUBJECT: Spelling

GRADE: 4th

TIME/DURATION: 1 class period

GOALS/STANDARDS(s): See Tennessee Fourth Grade Spelling Standards

OBJECTIVES:
Students will create word association pictures using all of his/her spelling words.

INTRODUCTION/ANTICIPATORY SET/ADVANCE ORGANIZER:
The student teacher will display samples of the word association pictures the student teacher collected during a case study. The student teacher will say, "These pictures are examples of word association pictures. Today, you will illustrate pictures using all 20 of your spelling words."

LESSON SEQUENCE:

- The student teacher will ask students, "What is the first thing that comes to your mind when I say BEAUTY?" (First word on spelling list) wait for responses
- The students will brainstorm several ideas
- The student teacher will tell them then for their first picture they will draw ________ (what they brainstormed).
- The student teacher will ask everyone to draw what they said during brainstorming session.

CLOSURE:
The students will show his/her illustration of the word beauty to classmates.

PRACTICE, REMEDIATION AND ENRICHMENT ACTIVITIES:
The student teacher will instruct students to draw a word association picture for each spelling word. If time does not permit, students will finish as homework.

INSTRUCTIONAL MATERIALS/RESOURCES/EQUIPMENT:
Spelling lists, Pencils, Art Paper, Markers, Colored pencils, Word association pictures examples

DIVERSITY ACCOMMODATIONS:
Diversity Accommodations will be made per student IEP. Students will be paired so that peer tutors can be utilized.

ASSESSMENT/EVALUATION:
The student teacher will evaluate pictures to determine if students can correctly.

Appendix G

Lesson 3

“Spelling Word Stories”

SUBJECT: Spelling

GRADE: 4th

TIME/DURATION: 1 class period

GOALS/STANDARDS(s): See Tennessee Fourth Grade Spelling Standards

OBJECTIVES:
Students will create a short story using all of his/her spelling words in correct context.

INTRODUCTION/ANTICIPATORY SET/ADVANCE ORGANIZER:
The student teacher will display writing sample enlargements of the case study the student teacher did as examples of a “Silly Story.” The student teacher will say, “These posters are examples of short stories using spelling words. Today, you will create a short story using all 20 of your spelling words.”

LESSON SEQUENCE:

- The student teacher will display writing example enlargements of short stories using twenty spelling words.
- The students will brainstorm a story idea.
- The students will write a short story using the twenty spelling words.

CLOSURE:
The students will trade papers with a peer. Students will proof-read peer papers. Students will give suggestions to classmates.

PRACTICE, REMEDIATION AND ENRICHMENT ACTIVITIES:
The student teacher will ask several students to share his/her story with the class.

INSTRUCTIONAL MATERIALS/RESOURCES/EQUIPMENT:
Spelling lists, Pencils, Papers, Dictionary, Thesaurus, Posters—Nicole Brewer Lantman

DIVERSITY ACCOMMODATIONS:
Diversity Accommodations will be made per student IEP. Students will be paired so that peer tutors can be utilized.

ASSESSMENT/EVALUATION:
The student teacher will evaluate stories to determine if students can correctly use sentences in context in the short story.

Appendix H

Lesson 4

"Spelling Poems"

SUBJECT: Spelling

GRADE: 4th

TIME/DURATION: 1 class period

GOALS/STANDARDS(s): See Tennessee Fourth Grade Spelling Standards

OBJECTIVES:
Students will create a poem using all of his/her spelling words in his/her choice of spelling forms.

INTRODUCTION/ANTICIPATORY SET/ADVANCE ORGANIZER:
The student teacher will read several poems by Shel Silverstein using a different variety of poetry. Most of this author's poetry is funny that students can relate to.

LESSON SEQUENCE:

- The student teacher will display a poem the student teacher wrote using the twenty spelling words.
- The student teacher will talk about the different types of poems, including free verse, acrostic, etc.
- The students will decide on which type of poem they will use in the assignment.

CLOSURE:
The student teacher will then ask students to think about a title for their poem. Students will be encouraged to brainstorm many ideas and write each down on paper.

PRACTICE, REMEDIATION AND ENRICHMENT ACTIVITIES:
The students will then create his/her own poem using the twenty spelling words.

INSTRUCTIONAL MATERIALS/RESOURCES/EQUIPMENT:
Spelling lists, Pencils, Paper, Dictionary, Thesaurus

DIVERSITY ACCOMMODATIONS:
Diversity Accommodations will be made per student IEP. Students will be paired so that peer tutors can be utilized.

ASSESSMENT/EVALUATION:
The students will share his/her poem with the class. The student teacher will use a rubric to determine grade.

Appendix I

Lesson 5

"Unit wrap-up/Assessment"

SUBJECT: Spelling

GRADE: 4th

TIME/DURATION: 1 class period

GOALS/STANDARDS(s): See Tennessee Fourth Grade Spelling Standards

OBJECTIVES:
Students will correctly spell the twenty words on the spelling list.

INTRODUCTION/ANTICIPATORY SET/ADVANCE ORGANIZER:
The student teacher will ask, "Which of the activities did you enjoy most this week?" Wait for student responses. "Which did you think most prepared you for test?"

LESSON SEQUENCE:

- The students will share which strategies most helped them with the spelling test.

CLOSURE:
The student teacher will give the spelling test.

PRACTICE, REMEDIATION AND ENRICHMENT ACTIVITIES:
At the end of the test, students will be asked to write a complete sentence for each spelling word. Students will then complete a survey about spelling lesson preferences.

INSTRUCTIONAL MATERIALS/RESOURCES/EQUIPMENT:
Pencils
Paper
Surveys

DIVERSITY ACCOMMODATIONS:
Diversity Accommodations will be made per student IEP.

ASSESSMENT/EVALUATION:
The student teacher will grade spelling tests and check sentences for correct context.

Multiplication Intervention in Sixth-Grade Math: An Action Research Project

Robin Z. Layne

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-110.

Introduction to the Problem

Last year was my first year teaching, and I went into the classroom with many misconceptions. I taught eighth-grade algebra, and assumed that I would immediately begin teaching eighth-grade material to students who were ready to learn and on grade level. I was surprised to learn that most of my students were not performing at a level that was conducive to learning algebra, and the abstract concepts it involves. However, I was completely shocked to learn that many of these students did not know their basic multiplication facts. While these students were afforded the luxury of using a calculator, I could not get past the frustration that these students would be able to perform much better if they had both an understanding and knowledge of the basic multiplication facts.

I am now in my second year of teaching, and have moved to sixth-grade math. Out of my 75 students, approximately 25 of them started the year knowing their multiplication facts. These 25 students are also the ones that scored “advanced” on the math TCAP, the standardized test for Tennessee.

Review of Literature

Students are typically taught multiplication in the third or fourth grade, and these students are expected to commit their multiplication facts to memory (Caron, 2007). In order for students to develop an understanding for computation and problem-solving skills, the basic math facts need to be, not only mastered, but “automatized” (Caron, 2007). The mastery of these basic facts is essential, if students are to become fluent in solving mathematical problems (Mattingly & Bott, 1990). If the automatic recall of these facts is not developed in students, they will never be willing to attempt mathematical questions and problems, and will, eventually, develop math anxiety (Caron, 2007). In fact, many of the negative attitudes that students have regarding math can be attributed to them not knowing their basic multiplication facts (Mattingly & Bott, 1990). These students learn to be helpless throughout school, and build a resistance towards learning math, at all. In order for students to complete the complex math tasks that are required throughout school, students need to be able to retrieve basic math facts quickly and accurately. Therefore, basic math fact fluency influences how a student performs in math because the higher-level math tasks require that students can complete basic facts (McCallum, Skinner, Turner, & Saecker, 2006). Students who can retrieve these facts automatically will have more cognitive resources from which to pull information, and a better conceptual understanding of the problem. When students can complete these math tasks rapidly, they will be more willing to, not only engage in math more, but also to take on more challenging math problems, without the underlying assumption that they will fail (McCallum, Skinner, Turner, & Saecker, 2006).

Some educators suggest that rote memorization and drill practices only hinder students' mastery of multiplication facts (French, 2005). Instead, students should be taught strategies they can use to figure out the multiplication problems (French, 2005). While educators debate which method is best for teaching students multiplication facts, the fact remains that it is vital that they know the basic times tables automatically. Without this ability, students will have difficulty performing higher-level math functions. This "automaticity" is required for estimation tasks and mental computations (Woodward, 2006). However, it is debatable as to whether or not rote memorization is the approach. Even though rote memory is found to be successful for 70 percent of teachers, it is the least effective method because the effort falls on the learner (Caron, 2007). The learner is struggling, and, most likely, will not want to memorize fact after fact, as the use of drill and practice exercises are mundane. This also leads students to believe that math is boring and unpleasant (Caron, 2007). In addition, rote memory does not aid in the understanding of the mathematical principles.

A good method of learning multiplication facts can be compared to how we know the names of our family members and friends. We did not sit down and memorize their names by using flash cards, but by using their names and interacting with them over time. The names became a part of our long-term memory. This is also true with multiplication facts. We have our students use the facts through practice over time through different strategies (Caron, 2007). Practice is the key to studying and learning math concepts and facts. Math is learned by doing, or, otherwise, known as practicing.

Being a middle school teacher, I am aware of the fact that there are many state standards that need to be taught in a limited amount of time. Students should have learned basic multiplication facts in elementary school. This being said, the fact remains that students are coming to middle and high school without this essential skill. It is obvious that an intervention is necessary, at some point, in order for students to develop an understanding of the math concepts that they are expected to learn and master. Do I put a calculator in their hands and hope for the best? Or do I intervene by developing a strategy to help them master these basic multiplication facts, which are essential to performing higher-level math tasks? I cannot change the curriculum which I am required to teach, but I can use different strategies within the classroom to help these students learn their facts to automaticity. The purpose of this study is to determine if having students use a consistent method of practicing their multiplication facts in class will help them to commit their facts to automaticity.

Date Collection and Results

Data Collection

Subjects

The participants in this study consisted of students in two of my sixth-grade math classes. The middle school consists of Grades 6 through 8. Approximately 40% of the students are minority and 67% of students participate in free and reduced lunch. The students come to us from four different feeder elementary schools, one of which is a Title I school. Six of the 50 students receive special services. Less than half of the students are on grade level in reading and math. Students are not randomly selected.

Materials

The materials needed for this study consisted of the practice worksheets that students used, a multiplication pre-test, a problem solving pre-test, a multiplication post-test, and a problem solving post-test.

Procedure

My first step was to distribute and collect signed parental and student consent forms, giving me permission to use these students as subjects. Seventeen students participated in the study. I then gave two types of pre-tests. The first pre-test consisted of different computational and problem-solving questions. The second was a timed multiplication test to use as a baseline to see where the students were, in terms of recalling these facts automatically (see Appendices A and B). I then intervened, using a strategy of practicing multiplication facts during the class period. I built in a small amount of time throughout the week for students to practice the multiplication facts for mastery, using a strategy taken from Caron’s case study (2007). Students were given a worksheet with rows of basic multiplication problems, but the first row contained the answers (see Appendix C). Students were timed, and “raced” against themselves, to see how many problems they could complete in 2 minutes. This only took a few minutes each time, so a great deal of instructional time was not taken from the class. Students could track their own progress and see their improvement. The answers were in front of them, so any test anxiety was removed, and it, instead, became a game. Students could compete either with themselves or with others working at their level, so differentiation was also at work. This also eliminated the need for them to study on their own, which was probably not going to happen, at this point. After the intervention period, I administered the two post-tests (see Appendices D and E). These post-tests were in the same format as the pre-tests, but the numbers used in the problems were changed. I then compared the pre-test results with the post-test results. I also observed the students to determine how their attitudes about multiplication had changed.

Timeline

This research project took 5 weeks to complete. I ran into difficulty getting my students to return the signed parental consent forms in a timely manner. This delayed the project for approximately 1 week. Another obstacle was the fact that, due to absences, some students were not in class consistently in order to complete all of the practice worksheets.

Results

The data was analyzed by comparing the pre-test scores of multiplication and problem-solving tests with the post-test scores. The graphs (see Figures 1-5) display the pre- and post-test scores of class 1 and class 2. In both classes, the students improved on the multiplication tests. However, the results were not as conclusive on the problem-solving tests.

As shown in Figure 1 and Figure 3, the majority of the students made improvements in recalling their multiplication facts with automaticity. Figure 2 and Figure 4 show the results of the students' pre- and post-tests for the problem-solving tests. Figure 5 shows the class mean for each test. While the majority of the students improved on the problem-solving test, the gains were not nearly as large as with the multiplication tests.

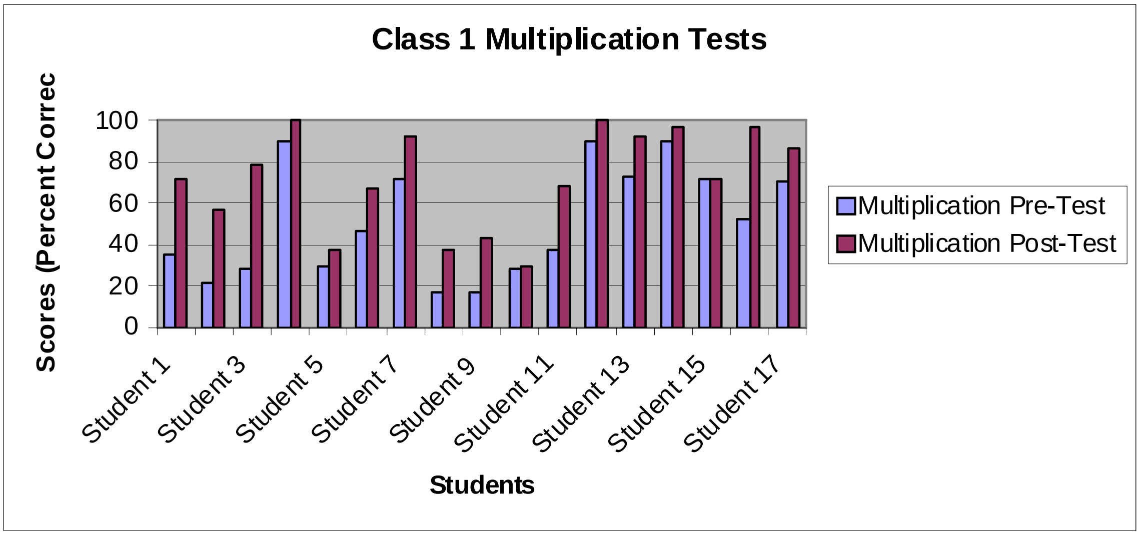


Figure 1. Class 1 multiplication tests.

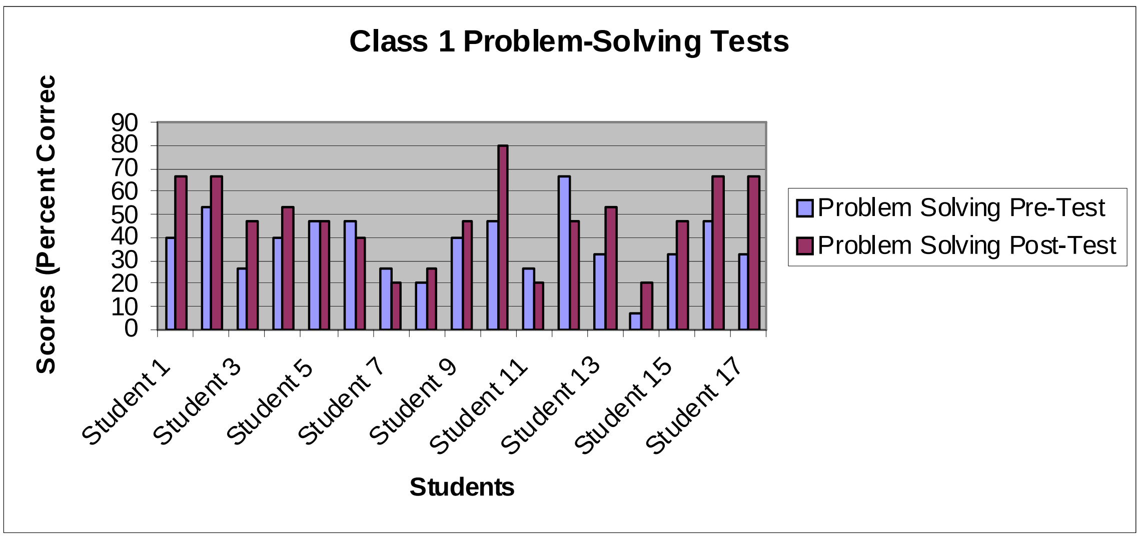


Figure 2. Class 1 problem-solving tests.

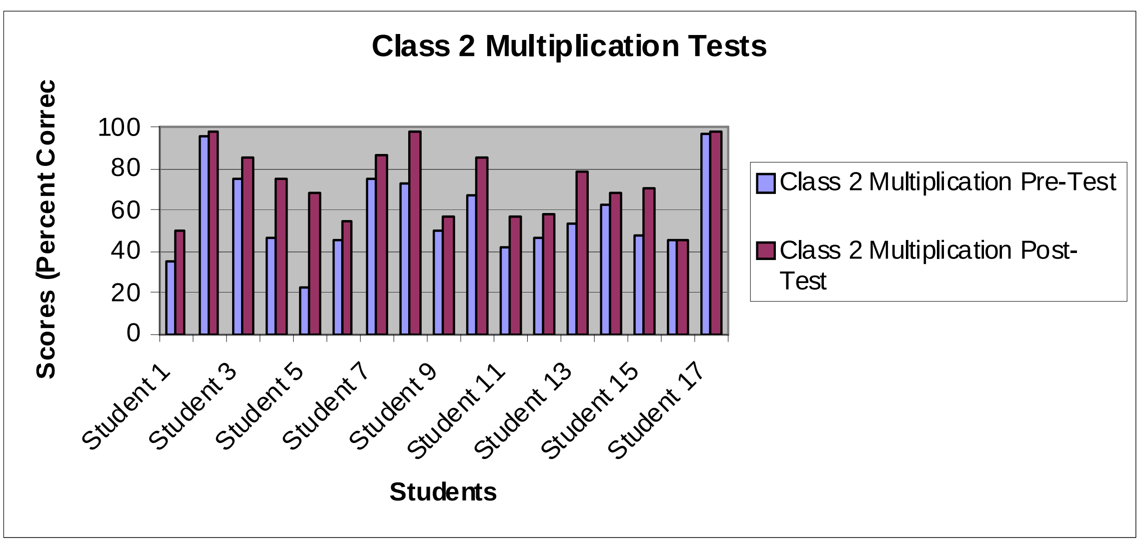


Figure 3. Class 2 multiplication tests.

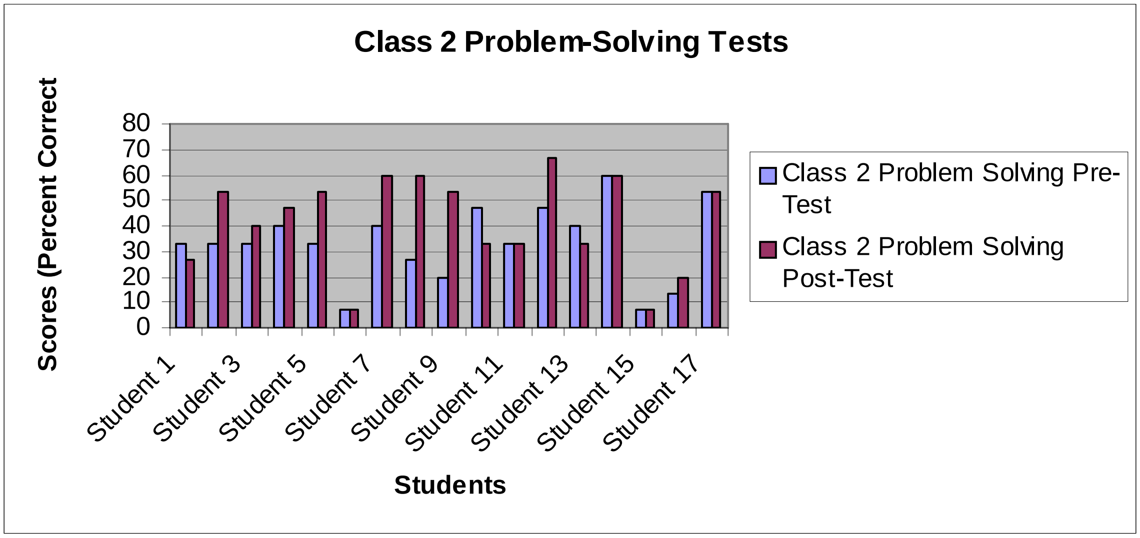


Figure 4. Class 2 problem-solving tests.

Figure 5 shows the class mean for each test. For class 1, the mean of the multiplication pre-test is 51.24%, while the mean class score of the post-test is 72.18%. This is an average class gain of 20.94%. For class 2, the mean of the multiplication pre-test is 57.65% while the mean class score of the post-test is 72.48%, showing an average class gain of 14.83%. The mean for the problem-solving pre-test in class 1 is 37.35% and the problem-solving post-test mean is 48%, showing a 10.65% gain. In class 2, the mean for the problem-solving pre-test is 33.29%, and the mean for the problem-solving post-test is 41.53%, showing an 8.24% gain. Again, this shows that, while both classes, as a whole, made improvements on the problem solving tests, the gains were not as large as on the basic multiplication fact tests.

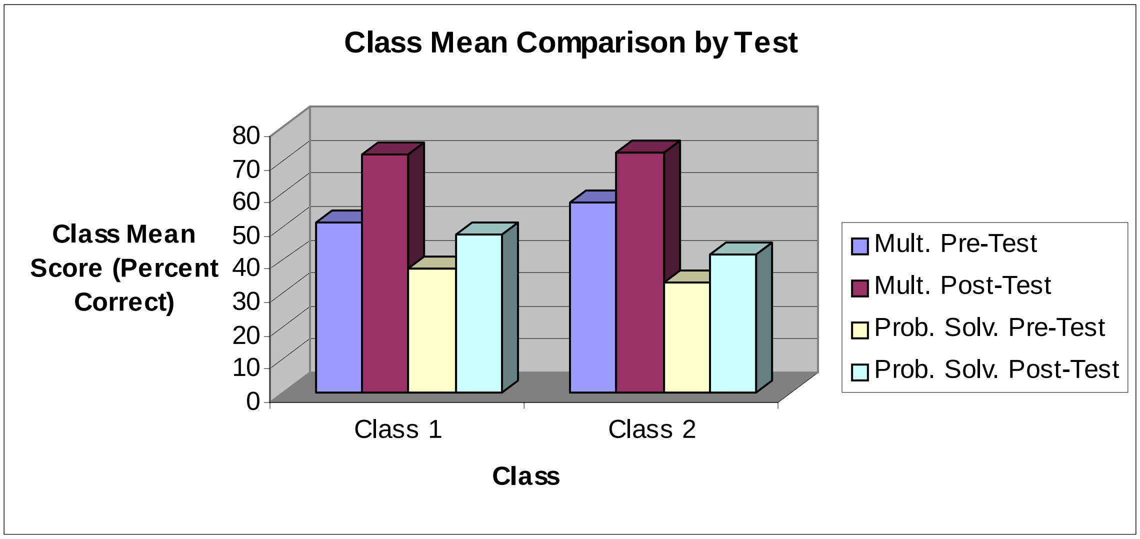


Figure 5. Class mean comparison by test.

Conclusions and Recommendations

What does all this mean? Based on my results, I can conclude that using this strategy does, in fact, work to help students learn their multiplication facts to automaticity. I believe that this is one tool, among many. The advantage to using this method is that the students enjoy doing the practice sheets. They think of it as a race or a game. My students actually asked, each day, if they could do the multiplication practice sheets. Any time you can get a child to learn, without letting him *know* that he’s actually learning, will lead to positive results. They liked the crutch of knowing that the answers were at the top of the page. They almost thought that they were “getting away” with something, and did not realize that every time they looked at one of the answers, they were studying! While I believe that this method works to help students learn their multiplication facts, based on the problem-solving test results, the intervention time period I used was not long enough to help students with their higher-level problem-solving skills. The multiplication facts need to be known already in order for a student’s higher-level math skills to benefit.

The school at which I teach has recognized the fact that there is a huge problem with students not knowing their multiplication facts. Many educators believe that we should not intervene at the middle school level to teach multiplication. I agree that we cannot really teach the concept of multiplication, but most of the students understand the concept. They were just never forced to memorize facts! The math department at my school has agreed to do a multiplication intervention at every grade level. I will be sharing my results with the entire math department to show how this method works. I would recommend that every middle school math teacher be trained on the importance of all students learning their multiplication facts to automaticity. If teachers understood the importance of this, and how it helps students to solve difficult math problems, I feel more middle school math teachers would be on board. They need to understand that these facts need to be learned to automaticity in order to help students understand the more difficult math problems, not just for the sake of memorizing them. A major benefit to this method is that it does not cost any money, aside from the copies to make the practice sheets. Even this cost could be eliminated if these problems were done on a computer. Instead of writing on paper, the students could possibly answer them on the computer. This would actually engage the students even more. The downside to this, however, is that not all schools are equipped with a computer lab, and, even if they are, classes are not granted full access to it, in many cases. If teachers had a few classroom computers, students could use this as a center activity in which to take the timed practice "tests." There are a variety of options that could be used to incorporate technology.

The key to student learning with this method is consistency. Teachers have many standards to teach, so a class plan needs to be devised to help these students learn the multiplication facts. Using the practice sheets as a "bell ringer" worked for me, and it helped the students to come in to class and get focused on math. The more they see them, the faster they'll learn. Why not have fun at the same time? Multiplication, anyone?

References

Caron, T. A. (2007, July-August). Learning multiplication: The easy way (case study). *The Clearing House, 80*(6), 278. Retrieved October 7, 2007, from Academic OneFile, Gale.

French, D. (2005, November). Double, double, double. *Mathematics in School, 34*(5), 8-9. Retrieved October 24, 2007, from Wilson Web.

Mattingly, J. C., & Bott, D. A. (1990, February). Teaching multipilication facts to students with learning problems. *Exceptional Children, 56*(5), 438. Retrieved October 24, 2007, from Wilson Web.

McCallum, E., Skinner, C. H., Turner, H., & Saecker, L. (2006, Summer). The taped-problems intervention: Increasing multiplication fact fluency using a low-tech, classwide, time-delay intervention. Retrieved October 5, 2007, from *School Psychology Review*, Academic OneFile, Gale.

Woodward, J. (2006, Fall) Developing automaticity in multiplication facts: Integrating strategy instruction with timed practice drills. Retrieved October 5, 2007, from *Learning Disability Quarterly*, Wilson Web.

Appendix A

PRE-TEST (LAYNE-MULTIPLICATION PROJECT)

1. A color printer can print six pages per minute. How long will it take to print 24 pages?
2. 254 x 5 = ______
3. 3.2 x 4.5 = ______
4. What is the area of a rectangle that is 12 cm by 3 cm?
5. What is the least common multiple of 6 and 8?
6. 23.7 x 100 = _______
7. What is the greatest common factor of 24 and 12?
8. If 3t = 90, what is the value of t?
9. The area of a rectangle is 48 square feet, and the length is 8 feet. What is the width?
10. A box will hold 14 oranges. There are 23 boxes filled with oranges. How many oranges are there?
11. 243 divided by 3 = ________
12. 99 apples are put in 9 different bags. How many apples are in each bag?
13. Twenty-eight of the forty-two teachers are female. Write this fraction in simplest form.
14. Eight more than three times a number is twenty-six. Find the number.
15. Ellen finds a pair of skis for $380. The skies are on sale for 20% off. Find the amount Ellen will save if she buys the skis during the sale.

Appendix B

Code:______________________________Date:___________________Score:___/60

7 X 9=	**8 X 11=**	**7 X 12=**	**7 X 8=**
3 X 7=	**9 X 4=**	**8 X 4=**	**12 X 9=**
2 X 8=	**11 X 7=**	**7 X 9=**	**6 X 9=**
8 X 8=	**7 X 6=**	**4 X 7=**	**6 X 12=**
11 X 5=	**6 X 7=**	**6 X 5=**	**8 X 7=**
11 X 9=	**7 X 11=**	**7 X 4=**	**8 X 7=**
9 X 6=	**7 X 8=**	**7 X 6=**	**4 X 7=**
8 X 4=	**11 X 8=**	**6 X 7=**	**4 X 10=**
6 X 7=	**8 X 4=**	**11 X 8=**	**9 X 7=**
5 X 11=	**4 X 7=**	**4 X 8=**	**8 X 8=**
7 X 6=	**4 X 7=**	**4 X 6=**	**9 X 3=**
7 X 6=	**8 X 11=**	**7 X 9=**	**9 X 5=**
7 X 6=	**8 X 11=**	**4 X 7=**	**12 X 11=**
7 X 5=	**9 X 8=**	**8 X 9=**	**6 X 7=**
7 X 4=	**11 X 8=**	**4 X 9=**	**2 X 11=**

http://math.about.com

Appendix C

Example of Multiplication Practice Worksheet

Code:____________________________Date:__________________Score:___/60

6	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**
x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**	**x12**
6	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**54**	**60**	**66**	**72**

6 X 9=	**6 X 2=**	**6 X 3=**	**6 X 8=**
6 X 7=	**6 X 1=**	**6 X 4=**	**6 X 8=**
6 X 7=	**6 X 6=**	**6 X 9=**	**6 X 7=**
6 X 2=	**6 X 10=**	**6 X 10=**	**6 X 2=**
6 X 5=	**6 X 7=**	**6 X 5=**	**6 X 7=**
6 X 9=	**6 X 3=**	**6 X 4=**	**6 X 6=**
6 X 1=	**6 X 10=**	**6 X 8=**	**6 X 7=**
6 X 4=	**6 X 8=**	**6 X 7=**	**6 X 10=**
6 X 7=	**6 X 4=**	**6 X 1=**	**6 X 10=**
6 X 3=	**6 X 1=**	**6 X 7=**	**6 X 8=**
6 X 6=	**6 X 7=**	**6 X 6=**	**6 X 8=**
6 X 6=	**6 X 3=**	**6 X 9=**	**6 X 5=**
6 X 6=	**6 X 2=**	**6 X 1=**	**6 X 3=**
6 X 5=	**6 X 8=**	**6 X 9=**	**6 X 7=**
6 X 4=	**6 X 8=**	**6 X 9=**	**6 X 2=**

http://math.about.com

Appendix D

Code:____________________________Date:__________________Score:___/60

11 X 9=	**8 X 3=**	**6 X 2=**	**7 X 8=**
3 X 6=	**9 X 4=**	**8 X 4=**	**12 X 9=**
2 X 8=	**3 X 6=**	**7 X 2=**	**7 X 9=**
8 X 8=	**6 X 5=**	**11 X 7=**	**7 X 2=**
3 X 5=	**12 X 7=**	**7 X 5=**	**8 X 7=**
3 X 9=	**4 X 3=**	**7 X 4=**	**8 X 8=**
9 X 7=	**2X 8=**	**7 X 3=**	**4 X 7=**
8 X 4=	**3 X 8=**	**7 X 12=**	**4 X 10=**
11 X 7=	**8 X 4=**	**3 X 8=**	**9 X 6=**
5 X 3=	**4 X 6=**	**11 X 8=**	**8 X 8=**
8 X6=	**4 X 7=**	**4 X 7=**	**9 X 3=**
12 X 9=	**8 X 3=**	**9 X 10=**	**9 X 5=**
7 X 8=	**8 X 12=**	**4 X 6=**	**2 X 3=**
7 X 5=	**9 X 8=**	**8 X 9=**	**7 X 9=**
7 X 4=	**3 X 8=**	**4 X 9=**	**2 X 12=**

http://math.about.com

Appendix E

POST TEST (LAYNE – MULTIPLICATION PROJECT)

1. A color printer can print eight pages per minute. How long will it take to print 48 pages?
2. 315 x 5 = ______
3. 4.4 x 2.3 = ______
4. What is the area of a rectangle that is 9 cm by 4 cm?
5. What is the least common multiple of 4 and 6?
6. 34.8 x 100 = _______
7. What is the greatest common factor of 32 and 24?
8. If 4t = 36, what is the value of t?
9. The area of a rectangle is 28 square feet, and the length is 7 feet. What is the width?
10. A box will hold 12 baseballs. There are 6 boxes filled with baseballs. How many baseballs are there?
11. 441 divided by 3 = ________
12. 66 apples are put in 6 different bags. How many apples are in each bag?
13. Thirty-two of the ninety-six students are male. Write this fraction in simplest form.
14. Four more than five times a number is nineteen. Find the number.
15. Marcus finds a video game system for $280. The video game system is on sale for 20% off. Find the amount Marcus will save if he buys the video game system during the sale.

Optimizing Time and Group Size in High School Mathematics Peer Collaboration

Isabel Miller

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-101.

Introduction to the Problem

The impetus for this project stems from the commonly-held belief by high school students that they don't enjoy or understand mathematics. The purpose of this study is to describe the effect of regular, small group activities (peer collaboration) in high school geometry class on individual student perception of self-efficacy, daily work performance, and test performance. Varied peer collaboration factors are investigated in hopes that the appropriate application of the results will effect an improvement in student learning and attitudes.

Review of Literature

A great body of information exists, in the literature, which extols the virtues of peer collaboration as a teaching strategy for all ages and in, virtually, all subjects. In the case of mathematics instruction, professional teaching organizations and academia tend to concur that peer collaboration encourages higher-order thinking skills and builds self-confidence among students. According to Ginsburg-Block (1999), the National Council of Teachers of Mathematics (NCTM) developed *Curriculum and Evaluation Standards for School Mathematics* (NCTM, 1989), which have led mathematics teachers to adapt innovative curricula and teaching methods. Major themes found throughout the standards include the use of concrete materials, problem solving strategies, and interaction with peers to promote conceptual learning. Although revisions have been made to the NCTM *Standards* (now called *Principles and Standards*), the message remains constant: all students deserve a mathematics education of high quality (NCTM, 1998). Powell (1998, p. 2) states,

> NCTM recommends that students be provided opportunities to work together cooperatively in large and small groups on significant problems-problems that arise out of their experiences and frames of reference. Group assignments help learners combine new

> knowledge with prior knowledge, leading to the construction of new ideas within the group. Students should question, discuss, make mistakes, listen to the ideas of others, provide constructive criticism and summarize discoveries.

In his explanation of appropriate implementation of peer collaboration, Powell (1998, p. 2) further suggests,

> For example, students might be given equations to solve that include the use of parentheses. Groups of students would work together to arrive at best solutions to the problems and then share their solutions and strategies with the whole class. Discrepancies among solutions would stimulate small group analysis of the procedures used and lead to ideas about rules for governing this situation. During the group process, the teacher can provide assistance when it is needed-conferring with the group about their solutions, posing questions to keep the group on track, and providing encouragement as the group progresses through the task. Groups would then report their findings and hypotheses to the whole class, explaining their use of parentheses to solve the problems.

Luther (2000) found that peer collaboration permits students to be actively engaged in learning by explaining their understanding of the problem and their method to solve it. This exercise of explanations encourages higher-order thinking skills. Explaining that, "developing higher order thinking skills by engaging in collaboration dates back to Aristotle, Plato, and Descartes" (p. 60-63), Luther believed that when individuals presented their conclusion and its rationale to others, they engaged in cognitive rehearsal, deepened their understanding of their position, and discovered higher level reasoning strategies. Along the same lines, Delisi & Samaha (2000) state, "children who engage in an active debate were more likely to improve their reasoning than those who were described as passive listeners" (p. 7). This position reinforces the prior conclusions drawn by Davidson and Worsham (1992) and Johnson and Johnson (1987). Davidson and Worsham found that, “as children discuss in groups, diversity of response necessitates explanation and justification, quite naturally extending and refining their knowledge” (p. 19). Johnson and Johnson concluded that student performance generally improved when students collaborated. It can be postulated then that when a student is not motivated to apply himself/herself to an assignment, he/she can be empowered by the dynamic of the group.

Wilgus (2002) studied the effect of peer collaboration in mathematics for 18, 8- and 9-year-old third graders. The control group consisted of children who worked on their math homework alone, and the experimental group consisted of children who worked in collaborative groups of three or four students. She found that there was no significant difference in academic success between students who worked collaboratively and those who did not. She concluded that “some children need the social interaction of peer collaboration to learn more effectively, while it inhibits others who learn in a different way” (p. 21). However, despite the statistical results, “the researcher observed the children responding positively to the group work” (p. 20-21). Wilgus’ study provided 20 minutes for the peer collaboration and postulated that 20 minutes may not always be sufficient because students work at different rates of speed, and homework difficulty varies.

A comprehensive study conducted by Webb, Nemer, Kersting, Ing, and Forrest (2004, p. 1) may shed some light on why different researchers may be obtaining varied levels of success with peer collaboration. The researchers examined the impact of teacher discourse on the behavior and achievement of students in the context of a semester-long program of cooperative learning in four middle school mathematics classrooms. In the authors’ discussion, they state,

> We conclude that student behavior largely mirrored the discourse modeled by and the expectations communicated by teachers. Teachers often instructed using a recitation approach in which they assumed primary responsibility for solving the problem, having students only provide answers to discrete steps. Finally, teachers rarely encouraged students to verbalize their thinking or to ask questions. Students adopting the role of help-giver showed behavior very similar to that of the teacher: doing most of the work, providing mostly low-level help, and infrequently monitoring other students' level of understanding. The relatively passive behavior of students needing help corresponded to expectations communicated by the teacher about the learner as a fairly passive recipient of the teacher's transmitted knowledge.

Clearly, just providing an environment for peer collaboration is not sufficient for students to accomplish it successfully. The teacher must provide the proper example and guidance for the students in the class to collaborate in a way that is beneficial.

Data Collection and Results

Data Collection

The research focuses on two characteristics of peer collaboration: the number of students assigned to complete the problems (1, 2, or 3) and the amount of time allotted for in-class problem solving (15 and 30 minutes).

Subjects

Students from three, 10th-grade Advanced College Preparatory Geometry classes were selected to participate in the study. Class A contained 11 students who continued to work independently. Class B contained 14 students who were asked to work in pairs. Class C contained 13 students who were asked to work in groups of three. During the course of the study, when students were absent or when the total number of students could not be divided evenly into groups, the size of the groups may have been increased or decreased to ensure that every student in Classes B and C were working with others, at all times.

Methodology

For each research question, three data sources are used. The research questions and their data sources are shown in Figure 1, and are defined as follows:

1. What is the effect of working in groups on student learning of mathematical concepts?

   What is the effect on the students' perceived comprehension and sense of self-efficacy?

   What is the effect on student performance?

2. What is the optimal number of students who can effectively work in groups?

3. What is the optimal amount of time that can be allotted for in-class group work?

Research Questions	Data Source 1	Data Source 2	Data Source 3
1. Effect on Learning?			
1.1 Self-efficacy	Student survey	Observation of class discussion	Class attendance
1.2 Performance	Observation of class discussion	Daily work scores	Test scores
2. Optimal number of students in group?	Student survey	Observation of class discussion	Daily work scores
3. Optimal time period of group work?	Student survey	Observation of class discussion	Daily work scores

Figure 1. Research questions for optimizing time and group size in high school mathematics peer collaboration.

Data Collection Methods

Figure 2 shows a matrix of the data collection methods used. Students worked independently or together in groups of two and three. Selections were based on test scores received on the PLAN test (the standardized precursor to the ACT college entrance examination) and grade averages for the year. Students with higher scores were grouped with students with lower scores to encourage a mentoring relationship. The time allotted for group work was varied from 15 minutes to 30 minutes (divided into two 30-minute blocks) for each group. The 15 minute time slot was applied to the first 15 minutes of class, where students reviewed work from the previous day, and the second 15 minutes, when applicable, was applied to the end of the class period for beginning the work assigned during that lesson.

Data (scores) were collected on three daily (class/homework) assignments for each student working in each size of group for each time allotment, and data (scores) were also collected on one set of test scores for each group for each time allotment.

At the end of the study, a survey was distributed to each student. The survey queried the students on their preferences and attitudes about the peer collaboration experience (see Appendix A).

Records of tardiness and absenteeism were kept, and these data were correlated with specific group variables. For example, did working in a group motivate students to be present for class and arrive on time?

Finally, the general quality of class discussions was recorded. Of particular interest was the determination of whether or not working in groups encouraged students to participate more or less fully in class discussions (see Appendix B).

TIME ALLOTTED FOR GROUP WORK	CLASS A – WORKING INDEPENDENTLY	CLASS B – WORKING IN GROUPS OF 2	CLASS C – WORKING IN GROUPS OF 3
15 MINUTES- AT THE BEGINNING OF CLASS	Scores on 3 daily assignments Score on 1 test Quality of Class discussion Student Self-efficacy and Perceived Comprehension Survey Attendance	Scores on 3 daily assignments Score on 1 test Quality of Class discussion Student Self-efficacy and Perceived Comprehension Survey Attendance	Scores on 3 daily assignments Score on 1 test Quality of Class discussion Student Self-efficacy and Perceived Comprehension Survey Attendance
30 MINUTES- 15 MINUTES AT THE BEGINNING OF CLASS AND 15 MINUTES AT THE END OF FRONTAL TEACHING	Scores on 3 daily assignments Score on 1 test Quality of Class discussion Student Self-efficacy and Perceived Comprehension Survey Attendance	Scores on 3 daily assignments Score on 1 test Quality of Class discussion Student Self-efficacy and Perceived Comprehension Survey Attendance	Scores on 3 daily assignments Score on 1 test Quality of Class discussion Student Self-efficacy and Perceived Comprehension Survey Attendance

Figure 2. Data collection of research variables.

Results

The results of the study are summarized in Figure 3. Class A, the control group, continued to work independently, and exhibited no change in any of the areas of study. Class B, working in pairs for 15 minutes at the beginning of the lesson, showed the most overall improvement. The scores on the daily assignments improved, mainly because all of the students completed the assignments. Once the students began working in groups, all assignments were turned in, whereas before the study, one or two students typically failed to turn in their work. The students working in pairs for 15 minutes also improved their test scores, although only slightly. The test score mean prior to the study was 85%, and the test score mean after working in pairs was 87%.

TIME ALLOTTED FOR GROUP WORK	CLASS A – WORKING INDEPENDENTLY	CLASS B – WORKING IN GROUPS OF 2	CLASS C – WORKING IN GROUPS OF 3
15 MINUTES- AT THE BEGINNING OF CLASS	Scores on 3 daily assignments- **No change** Score on 1 test- **No change** Quality of Class discussion- **No change** Student Self-efficacy and Perceived Comprehension Survey- **No change** Attendance- **No significant change**	Scores on 3 daily assignments- **Improved** Score on 1 test- **Slightly Improved** Quality of Class discussion- **Improved** Student Self-efficacy and Perceived Comprehension Survey- **Improved** Attendance- **No significant change**	Scores on 3 daily assignments- **Improved** Score on 1 test- **Slightly Improved** Quality of Class discussion- **Improved** Student Self-efficacy and Perceived Comprehension Survey- **Improved** Attendance- **No significant change**
30 MINUTES- 15 MINUTES AT THE BEGINNING OF CLASS AND 15 MINUTES AT THE END OF FRONTAL TEACHING	Scores on 3 daily assignments- **No change** Score on 1 test- **No change** Quality of Class discussion- **No change** Student Self-efficacy and Perceived Comprehension Survey – **No change** Attendance- **No change**	Scores on 3 daily assignments- **Improved** Score on 1 test- **No significant change** Quality of Class discussion- **No significant change** Student Self-efficacy and Perceived Comprehension Survey- **Improved** Attendance- **No significant change**	Scores on 3 daily assignments- **Improved** Score on 1 test- **No significant change** Quality of Class discussion- **No significant change** Student Self-efficacy and Perceived Comprehension Survey- **Improved** Attendance- **No significant change**

Figure 3. Summary of quantitative and qualitative results.

The students in Class C, working in groups of three for 15 minutes, showed improvement in daily assignments and test scores similar to those in Class B. In all three classes, the attendance and tardiness records showed no change. When the time allotted for group work was increased to 30 minutes, the groups still showed some general improvement, although the improvement was less significant. In fact, 30 minutes was found to be an unreasonably long period of time to work independently of the teacher, so this was abandoned as soon as the study was concluded.

According to records kept on class discussions and results of the surveys given to the students, working in groups was generally well-received among the students. Most students felt the group work prevented them from getting bored in class, and allowed them to enjoy interaction with their peers while they worked on their assignments. Almost all students stated that they would like to continue working in groups. Students also commented that they felt they understood the concepts better after helping one another solve the problems. Only two of the respondents did not like working with others. In fact, those students were paired together, but chose to continue to work alone, although they were placed in a group. While many of their peers saw an improvement in their scores, they did not. Interestingly, the students who experienced the greatest improvement in their scores were among the least successful in the class prior to the study. Further, it was observed that those same students, those who, also, historically failed to participate in class discussions, tended to be far more engaged after working with others. Class discussions tended to be less dominated by the more assertive members of the class, and the classroom environment tended to have a more positive tenor. One disadvantage of the group work, however, was that some of the students became easily distracted by the higher level of social interaction, and a greater than normal level of control had to be exerted to keep the students on task. This issue seemed a little more prevalent when students were working in groups of three, where the discussions, at times, became more spirited and social in nature. When the group work was increased to 30 minutes, the time remaining in the class period for instruction was so limited that many of the groups asked for regular teacher help while completing the assignment. The higher level of interaction between the teacher and the groups caused the peer collaboration dynamic to be frequently interrupted, and the student groups lost much of their structure, either asking questions of others who were not in their groups or asking the teacher to expand on topics covered during the lesson.

Conclusions

In general, this study appears to support the consensus among the mathematics education community that working in groups can have a positive impact on learning. Although the sample sizes were small and the results were not what one could call dramatic, a discernible improvement did occur in scores on daily assignments and tests, as well as in students' views on self-efficacy and perceived comprehension. Perhaps creating an environment which encouraged a dialogue between the students provided a context for their engagement with one another and the concepts they were learning.

It should be noted that one distinction between this study and many of its predecessors is class size. In many of the previous studies, class sizes, when provided, were generally in the 25 to 30 students per class range. In this study, the number of students in Classes A, B, and C were 11, 14, and 13, respectively. These small class sizes already provided many opportunities for students to interact with the teacher and with one another, without providing a chaotic environment. It is possible that peer collaboration could be much more effective in classes which are so large that class discussions must be restricted to maintain order.

Further, while other studies saw an improvement in attendance and tardiness, the school in which this study was completed has relatively stringent attendance policies and an electronic attendance system which is monitored by an attendance officer, at all times, during the school day. Considering how few attendance issues were experienced prior to the study, it is no surprise that improvements were not observed.

Recommendations

Recommended actions are summarized in Figure 4. Developing a peer collaboration classroom dynamic is a wonderful instructional tool which can be implemented at, virtually, no cost to the teacher, except for some minimal planning time. Students can be paired with other students on most any assignment, provided that the teacher maintains an appropriate amount of oversight in the classroom. When considering the amount of class time to devote to peer collaboration, the teacher should take into account how much time is necessary for instruction so that the students have the tools to complete the assignment, without too much participation on the part of the teacher. Students, especially high school students, are naturally quite social, and seem to perform their assignments with more enthusiasm and a greater sense of accomplishment if they are helping one another to solve problems.

Since the sample sizes in this study were too small to perform traditional statistical analysis methods, it is recommended that further research in this area employ either larger sample sizes or the use of non-parametric statistics. Perhaps, in the future, more definitive results can be obtained on the variables studied, and additional variables could be investigated. Acquiring grant money for research in these areas is advisable and suggested, since results could have a lasting positive impact on many students in school systems locally and globally. For example, it would be interesting to determine if the ability levels of the classes (honors classes versus college preparatory classes), the ages of the students, the sizes of the classes, the specific subject areas, or the instructional tools employed by the teacher impact the results. In particular, it is suggested that further research be conducted on peer collaboration and technological instructional tools. Many educational interactive computer programs exist which grab and hold a student’s attention in most mathematics subject areas. Mathematics teachers are utilizing these programs more and more to demonstrate and teach mathematical concepts. With the advent of this new technology, mathematics classrooms are being transformed. Effectively applied peer collaboration instructional techniques could allow students to work together in this framework, much like we often see several students grouped around a video game. Rather than either resisting the entrance of this technology into the classroom or embracing all aspects in all circumstances, knowledge of the effects of peer collaboration when students are engaged in technology is essential.

Summary of Findings Research Questions	Recommended Actions Targeted to Findings	Who is Responsible for the Action?	Who Needs to Be Consulted or Informed?	Who Will Monitor?	Timeline	Resources
1. Effect on Learning?						
1.1 Self-efficacy	1.1 Incorporate group work into lessons	1.1 Teacher	1.1 Principal Parents Students	Teacher	Immediate and ongoing	No cost - Teacher time
1.2 Performance	1.2 Incorporate group work into lessons	1.2 Teacher	1.2 Principal Parents Students			
2. Optimal number of students in group?	2. 2-3	2. Teacher	2. Parents Students	Teacher	Immediate and ongoing	No cost - Teacher time
3. Optimal time period group work?	3. 15 min.	3. Teacher	3 Parents Students	Teacher	Immediate and ongoing	No cost - Teacher time

Figure 4. Steps to incorporate results into the classroom.

References

Davidson, N., & Worsham, T. (Eds.). (1992). *Enhancing thinking through cooperative learning.* New York: Teachers College Press.

Delisi, R., & Samaha, N. (2000). Peer collaboration on a nonverbal reasoning task by urban, minority students. *The Journal of Experimental Education, 69*, 5-21.

Ginsburg-Block, M. (1999). *Standards-based interventions in elementary mathematics.* Center for Applied Research and Educational Improvement, University of Minnesota, *7*(2).

Johnson, D., & Johnson, R. (1987). *Learning together & alone: Cooperative, competitive, & individualistic learning.* Englewood Cliffs, NJ: Prentice-Hall Inc.

Luther, A. (2000). The "old" method of teaching vs. the "new" method of teaching. *Journal of Thought, 35*, 59-69.

National Council of Teachers of Mathematics. (1998, November). A first look at principles and standards in school mathematics: Discussion Draft. *News Bulletin,* pp. 1, 8.

National Council of Teachers of Mathematics. (1989). *Curriculum and evaluation standards for school mathematics*. Reston, VA: National Council of Teachers of Mathematics.

Powell, M. (Ed.). (1998, Fall). Cooperative learning. *Classroom Compass, 1*(2). Southwest Educational Development Laboratory.

Webb, N., Nemer, K., Kersting, N. Ing M., & Forrest, J. (2004). *The effects of teacher discourse on student behavior and learning in peer-directed groups.* CSE Report 627. Center for the Study of Evaluation (CSE), National Center for Research on Evaluation, Standards, and Student Testing (CRESST), Graduate School of Education & Information Studies, University of California, Los Angeles, CA.

Wilgus, B. (2002). *The relationship of peer collaboration on third grade student math performance*. Master of Arts Action Research Project, Johnson Bible College. (ERIC Document Reproduction Service No. ED469634)

Appendix A

Student Survey

Please answer the following questions to the best of your ability. Student code ____________

1. Did you work alone, or were you placed in a group? If you were placed in a group, what was the size of the group you were assigned?

2. Were you able to more easily focus and concentrate on your work during in-class work time, or was it more difficult to focus and concentrate once we started working in groups?

3. Do you think you work better alone or in a group?

4. Do you think you need more or less time than you have been given to complete work during class?

5. Compare the classroom you were in before we placed students in groups, to the classroom you see today.

6. Give one example, which you find MOST beneficial, of how the class has changed.

7. Give one example, which you find LEAST beneficial, of how the class has changed.

8. In general, do you think we ought to work in groups throughout the entire year to improve your ability to complete work on time and make the class more enjoyable?

9. Any other comments or suggestions?

Appendix B

RECORDKEEPING SHEET OF CLASSROOM DISCUSSIONS
FOR THE STUDY
"OPTIMIZING TIME AND GROUP SIZE IN HIGH SCHOOL MATHEMATICS PEER COLLABORATION"

Date: ____________ Class Period: ______________ Group Size: ____no groups
____ pairs of two
____ groups of three

Starting time of group work: ____________ Ending time of group work: ____________

Total time of working in groups: __________ minutes

Today's group assignment : ____

Overall class observations:

Students during the class discussion seemed:

1	2	3	4	5	6	7	8	9	10
bored and uninterested				neutral				involved and engaged	

Estimated percentage of students in the class participating in class discussion:

10	20	30	40	50	60	70	80	90	100

Students tended to drift away from the focus of the lesson:

1	2	3	4	5	6	7	8	9	10
Constantly	sometimes			occasionally			rarely		not at all

Other observations:

____
____
____
____
____

Supplementing the Social Sciences: Changing Technologies and the Utility of Video Instruction

Joel W. Miller

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-104.

Introduction to the Problem

Technology in the classroom has become more useful and affordable since the days of the chalkboard and slide projector. New technologies such as digital media, broadband, and video-streaming should increase the popularity of visual supplements to classroom instruction through ease of access. Temporal and financial resources in America's schools are scarce. Thus, where and how these resources are applied is crucial to successful learning and to the future of our citizenry. Trends in education have heightened social studies educators' awareness of the effectiveness of curriculum that engages students. Finding efficient methods of achieving this ends is crucial to the field of social studies education.

The *No Child Left Behind Act* of 2001 and the increasing pressures of global competition require that educational resources demonstrate their effectiveness. Accountability demands responsibility. Teachers must explore useful techniques and alter their practices accordingly. The technology that makes the virtual union of people and places possible has the potential to bring great leverage to people at low cost. But the technology will not, in itself, fulfill any potential; it must be used wisely and intentionally by an educated population. This study hypothesizes that media supplemented instruction will improve participants' interest in the social studies, but such supplementation will not guarantee academic obtainment based on state standards and normal classroom assessment. Several other research questions will be addressed.

Review of Literature

Video, and all technology that produces moving images, can be used by teachers to promote academic success. Although nominal changes, such as format and storage, are occurring rapidly in video technology, the general use of video will always have the potential to endorse learning by captivating students. According to a study by Rideout, Vendewater, and Wartella, children under the age of 6 spend an average of 2 hours per day watching television or computer screens. This is more than twice the amount of time the sample spends reading or being read to (2003). The same study also states that, of this age group, 25 percent are active computer users. Additionally, the same percentage has a TV, VCR, DVD, or video-gaming system in their bedrooms. These facts illustrate the role of television-media in the lives of American youth. The skeptic may suggest that such an interest is corrupting our future society, harming cognitive development, and simply wasting children's time. The skepticism that exists, with regard to this issue, today, has also appeared in times of other new technologies. Comic books and video games were frowned upon when introduced to American youth. Like new video-media, comics and gaming systems have been altered for learning purposes. Young learners are enchanted with video-media; however, the uses of these technologies have the power to both attract and distract. Finding the proper balance is the purpose of the present study.

People intuitively benefit from the power of an image to derive meaning. The timeless expression that a picture is worth a thousand words accurately simplifies the potential benefits of visual learning. From the learning perspective, television offers multiple means by which to encode new information. Motion of images, sound, and, even, text all provide methods of learning. According to Radtke, Stern, and Wetzel (1994), video aids the learning process by allowing students to process abstract thoughts by encoding both language and image. Subjects that consist of real-life events and characters would seemingly benefit the most from video. Witnessing a past occurrence is obviously impossible. Imagining never-before-seen cultures in the social studies can be equally difficult, but video-media technology may help narrow such limitations.

Some video-media can leave you feeling dumbfounded or overwhelmed with images; yet, research explored in this review fails to attribute such confusion to an overload of different stimuli. One study suggests that comprehension is more likely to occur when various means of encoding occur simultaneously (Kozma, 1991). Additional research proposes that adding sound to pictures increases learning more than simply adding motion (Radtke, et al., 1994). Video operates using both audio and visual stimuli, and pupil comprehension is determined by processing abilities (Anderson, 1983). Students' interests and processing abilities vary greatly. Some have the ability to encode new information rapidly, while others struggle to construct new concepts. Inversely, video's effectiveness to relay information also varies. Certain films and instructional methods may not supplement a specific concept well. Despite subject limitations, research by Golden (2004) suggests that instructional technology is making, "…the learning more student-driven and the classroom more student-centered" (p. 42). Consequently, increased encoding enhances learning, proper processing and retrieval assumed, and test scores rise while content knowledge advances.

Before developing a hypothetical, situation-specific action research plan to increase video-media effectiveness, a more detailed review of research seems necessary. Deng & Zhang (2004) comparatively assessed students' perceptions of their learning accomplishments, their instructor's teaching methods, and their satisfaction with the technology obtained in each classroom. The research was conducted at a mid-sized, southern state university. The hypothesis is supported in the study as no significant difference in students' perceptions of their learning with multimedia technology exists, comparatively, to students in traditional classrooms. Yet, student reports on their teachers' instruction in multimedia classes were more positive than those reported by students in traditional classrooms.

The literature included by Deng & Zhang indicates that there is an important relationship between instruction technology and learning. This relationship is currently changing very rapidly. Most classrooms using technology to aid instruction are adequately equipped with basic video capabilities. Related literature emphasizes the importance of instructional technologies because they allow teachers to, "…use technology to foster student curiosity and creativity, as well as engage students in meaningful problem-solving activities" (2004, p. 42). Ranker (2000) defined the multimedia classroom as, "…one in which any commonly available media could be used in a permanent installation that is reliable and stable" (p. 36). Although the cost of such technology installation is high, permanent classroom units are more accessible than portable media devices.

The traditional classroom favors lecture-based instruction, and is commonly described as a room with rows of seats, and is typically teacher-centered. Deng & Zhang outline several technological restraints that occur in the traditional classroom. Primarily, the use of technology in traditional classrooms is referred to as "slow and complicated" (2004, p. 89). Although this opinion appears to contain bias, the terms "slow and complicated" do represent common frustrations experienced by many instructors with limited knowledge of how best to use technology in education. The findings of Deng & Zhang are applicable to other grade levels outside of the university setting, and the results are beneficial to educators who seek to use video instruction. For example, their research suggests that certain students make better use of media than others because of their experience with technologies. Marshall expounds this claim by suggesting that spatial images foster beliefs, interest in a topic, and improved memory (2002). Familiarity with television-media is important, and lack thereof is not a concern amongst experienced young learners. Since the social studies incorporate distant and mysterious cultures, visual images related to content potentially will engage students. Marshall cites a study by Wiman & Mierhenry, published in 1969, that supports the hypothesis of engagement and improved retention through multiple means of acquisition, such as visual and auditory, and through mediums that combine processes (2002). Therefore, teachers can maximize memory by using more than one instructional method. Some methods, such as computer usage, require some training. On the other hand, video is a simple method to which all students can relate and from which they can learn. The data produced by Deng & Zhang (2004) was quantified, and could benefit from further qualitative research.

The study conducted by Baker, Dimino, Gersten, Peterson, and Smith-Johnson (2006) investigated the relationship between visual supplements and learning in a middle school history classroom, through a video documentary titled, *Eyes on the Prize*. The video was used through two separate instruction methods. The sample was an equal mix of average students and those with learning disabilities. The students' disabilities were mainly related to insufficient reading skills. The research was important to the topic of video instruction in the classroom because it focused on a population struggling to learn from text alone. Video lecturing was used as an alternative to traditional instructional methods that revolve around coding procedures found in lecture and textbook instructional methods. The study's curriculum also included readings and group dyads to supplement the topic, "Civil Rights from 1954-1965," in American history. Both average and exceptional learners, from the control and experimental groups, displayed significantly higher scores on two of the three content tests. Therefore, the video supplementation was beneficial to student learning of the historical concepts.

Jordan and Sanchez (1994) researched classes at the Air Force Academy on the topic of video supplementation in the classroom. Three exams were distributed to test the students placed in control groups, with and without multimedia supplementation. Only the first exam showed significantly different scores between groups. Video lecture students did do slightly better, overall, in the course, despite the lack of statistical significance between the last two tests. The video lecture received a lower rating than the traditional class from students, which implies that the instructor is more important than the technology available in a classroom. This is an important statement that reflects the perceived value of video-instruction in relation to lecture-instruction.

Video usage is very popular in American schools. According to one study, over 50 percent of American teachers use video instruction during the year, with more frequency than use of the Internet (Grunwald Associates, 2002). Teachers at the school where this study was conducted rarely used the Internet for classroom projects because the computer labs are shared spaces. Internet lessons require multiple computers, and schools often do not have the funding for such expenditures. Short-comings of the study were minimal, but included homogenous population of the academy; limiting diversity of scores; and the confidentiality of the research may have been leaked, causing a potential increase of effort from the control group, once they learned a comparison across groups might occur. Regardless, video-instruction can be an effective and efficient means of educating when properly utilized in the classroom.

What method is to be considered the most efficient? Action research is the educator's preferred method of assessing and maximizing resources. An action research plan will attempt to further answer that question, and the following research questions.

Research Questions

1. Are students more or less receptive to information shared via video presentation? This study hypothesizes that students will be more receptive to video-media for the duration of the study.
2. In what ways can teachers ensure adequate learning of state or national standards with the use of technology-aided instruction? This study predicts that teachers should determine how much classroom time to allot for media-supplemented instruction.
3. Can supplemented instruction increase the level of interest, and, perhaps, motivation, via improved self-perception of learning abilities, in a high school social studies class? This study predicts that levels of interest for the social studies can be increased with media-aided instruction.
4. Will video-instruction increase content knowledge, as determined by classroom quiz grades and test scores? This study predicts that scores will improve with the aid of video-instruction.

Data Collection and Results

Method

Participants

Surveys and observations will be collected from a public high school in Hamilton County, Tennessee, over an 8-week period. Thirty-seven students, 18 males and 19 females, in three high school social studies classes will participate. Participants range in age from 15 to 18 years. The average age for males is 17.1 years, and for females is 16.9 years old. This is, roughly, a junior level average. Thirty-five participants are African-American and 2 participants are Caucasian. A small group of teachers responded to the teacher survey at the end of the study. Names were not given, only subject taught, and responses or comments to questions.

The high school is largely urban, and consists of a predominantly African-American student population. The respondents in each group range from low- to high-achieving, but none has specific modification plans. All participants will receive a final assessment score according to their classroom input and test scores, including those of the study and those not participating. No participants left the study once it began, but several data sets were missing, periodically, because of school absences.

Instruments

The environment is a traditional style classroom, with 35 desks arranged in rows facing one another; dry-erase boards, a television, and an LCD overhead projector with sound are in the classroom. An initial and follow-up survey is included to assess student perception of various instructional methods. Quizzes contain state mandated content and are reliable for the purposes of the curriculum and this research. Participants are familiar with the form of the assessments, and should not experience test-anxiety because of this familiarity. Appendices are as follows:

A. Initial survey - gathers data after the first experimental lesson, identifying weekly reading and media log averages, perceived teacher satisfaction, and preferred learning strategies.

B. Initial survey data - gives summary of Appendix A.

C. Follow-up survey - analyzes participant preference for experimental methods.

D. 5-minute incremental instructional lesson and assessment - Hitler and Chamberlain.

E. 10-minute incremental instructional assessment and lesson - The Way We Live.

F. 10-minute assessment pre-test and post-test comparison between control and experimental groups.

G. 15-minute video incremental handout from lesson on Stalin.

H. Formative assessment form for both groups.

I. 30-minute video incremental method handout - T. E. Lawrence pre-reading activity.

J. Teacher survey - measures teacher use of video-media by subject and standards.

Sources of films used vary from educational foundations to Hollywood productions. For the purpose of this study, the method of instruction will be the primary focus, rather than the type or educational quality of each media source. However, each piece of media is accessible from the library at The University of Tennessee at Chattanooga, and, since this research is being done in a public school for learning purposes, no copyright laws will be violated. Surveys will be used to find correlations between interest, abilities, and the effectiveness of the instructional method. The initial survey consists of questions regarding gender, age, ethnicity, amount of time spent reading and watching television, and a teacher approval rating.

Procedure

Classes will be divided into control and experimental groups. Previous academic successes will not be taken into account before groups are assigned; thus, all assignments are random. Neither group should be aware that other group will be experiencing different instructional methods. The third group will serve as additional data sources for surveys, and will experience all methods of instruction presented to control and experimental groups. Thus, some variance may support the effectiveness of different methods. (Note: The third group was included in the aggregate pre-test in Figure 4. Student post-quarter grades were not significantly different from either of the other two groups, and were not included in any discussion regarding impact on the study.)

The control group will experience the same materials as the experimental group. Content is accountable to Tennessee state curriculum standards. Groups will be divided by normal class periods, and all classes are on a 75-minute block schedule. This should ensure that each class stays together while moving through the lesson. Both groups will be tested over the same materials; the difference is that the experimental group will receive instructional supplements via video-media. Both groups will use various strategies including reading alone, reading in groups, watching video-media (experimental only), listening to direct instruction, and a blend of instruction and media supplementation. The control group will explore concept development through interactive writing assignments in the place of media instruction. In review, the control group will experience the same strategies with the exception that there will be no media reinforcement. Instead, there will be various instructional strategies based on state standards and the unit outline.

The academic unit covers both government and World War II. A pre-test of the unit will be given on the first day of class. The data from the unit pre-test will be used to determine progress between classes. Data will be collected through several methods: quizzes will be distributed toward the end of lecture classes for the control group, or after a video-instructional period in the experimental group. Immediately following the quiz, a survey will be distributed to assess how the students perceived the effectiveness of the video and the instructor. The two groups will be compared upon completion of the unit curriculum. Any significant differences between groups as a result of the action research plan will result in the altering of instruction to maximize the opportunity for knowledge acquisition. To maintain fairness in the classroom, this study will only differentiate method according to group on 4 days.

Each new lesson will incorporate material from previous lessons, as well as new material. All assessments will be constructed with similar, if not identical, questions between groups. Little information will come directly from any video-media; the focus of assessment is on the concepts within, as outlined by the Tennessee state curriculum standards.

Both groups will maintain a reading and media use journal or log for the duration of this study. Results of the logs may offer insight to correlations between learning or interest and the method used for each group. Twice per week, the experimental group will experience a lesson incorporating media-supplemented instruction. Lessons will vary according to the amount of time that the teacher spends directing the lesson between periods of video-instruction. The experimental method will incorporate a 5-minute increment (Appendix D) and assessment; a 10-minute incremental lesson and assessment (Appendix E); a 15-minute incremental lesson with assessment (Appendix G); and a 30-minute incremental instructional method. The process of video-presentation, followed by instructional interruption, theoretically, should determine which amount of uninterrupted, video-media supplementation is most conducive for knowledge acquisition and the facilitation of student engagement. Duplication of this study and future recommendations should be noted.

Analysis

Data will be analyzed using Microsoft Excel, and charts and graphs will be imported into Microsoft Word. Averages will be the primary source of statistical description. All data will be reviewed after all instructional methods have been tested. Teacher surveys will be reviewed at the end of the study to be included in the discussion section of this research.

Results

Surveys and assessments provide the data for the following results. Figure 1 displays the results of the participants' weekly reading and media logs. Each week, groups were asked to keep a record of how much time they spent reading outside of the classroom during the school week from Monday through Friday. Also, they were asked to mark how much time they spent viewing media such as video or DVD. This study does not consider the Internet as a source of media because the experimental instruction does not include the Internet.

Both groups of participants kept a log. Male students spent over an hour more per week viewing media, on average, than did their female classmates. As a whole, the students spent more than twice as much time using media for study or entertainment than in front of a book or digital text. Student weekly hours are reported as averages at the top of the figure.

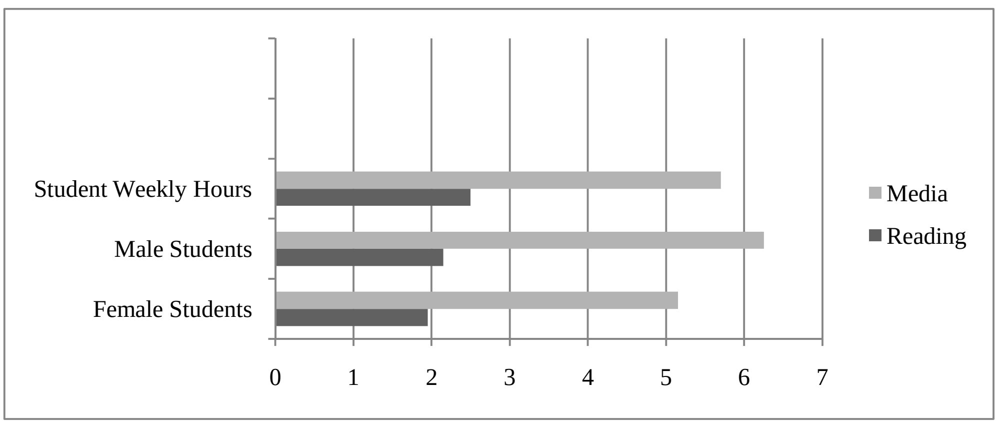


Figure 1. Weekly reading and media log averages in hours.

The results of the initial survey (Appendix B) show that all but 4 of the 37 respondents get more satisfaction from video-media than they do from reading. All four students who note preference to reading are female. Through self-report, participants prefer to learn by watching video-media and listening to teacher interjection or facilitation. Their second preference is to read in groups, followed by simply watching educational video-media. As a whole, media-related instruction is favored in all surveyed categories, thus far.

Upon completing the video-supplemented unit, respondents report their self-efficacy via survey (Appendix C). Participants in the experimental group report an “average to high” level of learning capability with the presence of video-supplemented instruction. Most also feel that media-aided instruction, overall, is a good learning tool. On aggregate, they report that they would enjoy other video-supplemented classes in the future. The participants also determined that their teacher does a better job teaching class with video-lecture than without it. (See Figure 2.)

Participants	Self-Perceived Level of Learning (With Video)	I Feel that videos are a good learning tool	Based on video technique, would you enjoy video in other classes?	Did the teacher do a better job teaching class with video-lecture materials than he does regularly without?
Numerical Average	3.7	4.2	3.0	1.3
Descriptor Average	Average to High	Agree	Probably Yes	Yes

Figure 2. Participant perception of video-instruction.

This study incorporated various methods of incremental lesson presentation in order to determine which best enables students to acquire and retain the maximum amount of information, without experiencing loss of knowledge or distraction from the lesson plans. Participants reported that the video-media should be stopped or paused every 10 minutes to maximize knowledge retention and encoding. The data from the survey in Appendix C suggests that, between 5 and 10 minutes into video-instruction, students desire a break to synthesize what information has been presented to them. Additionally, students prefer the instructional method of pausing the video-media over methods such as writing notes from PowerPoint, reading something related to the content, taking notes from the teacher and filling them in, as well as, talking to their classmates to analyze the lesson for the purposes of retention and understanding. (See Figure 3.)

	How often should the video be stopped in order for you to learn best?	Rate the strategies 1-5 according to your preference: 1 being the one that is MOST helpful; 5 being the one that is the LEAST	Instructional Strategies Ranking
Not at all	6	Teacher pausing video once in a while to explain and discuss	1
1 time every 5 minutes	10	Writing notes within a structure that the teacher hands out	2
1 time every 10 minutes	11	Writing my own notes	3
1 time every 15 minutes	7	Reading something related to the video before or after viewing	5
1 time every 30 minutes	7	Talking to my classmates afterwards about the video	4
Student Preference	Average=3.0 (1 time every 10 minutes)	Preferred Strategy	Pause video periodically to explain/discuss

Figure 3. Intermittent instruction and preferred strategies. Student preference section represents the method or strategy chosen most often by participants. Questions are items 9 and 10 in the follow-up survey.

Figure 4 displays the low pre-test data for both the experimental and the control groups. However, at the end of the unit study, the control group—those without media supplemented lessons—did more favorably, overall, with scores in the low 80s, compared to an average of 67 for the experimental group. Both groups showed significant improvement from pre- to post- test analysis. Scores were nearly doubled for both the control and experimental groups over the course of the unit. Yet, experimental averages were below passing for the course.

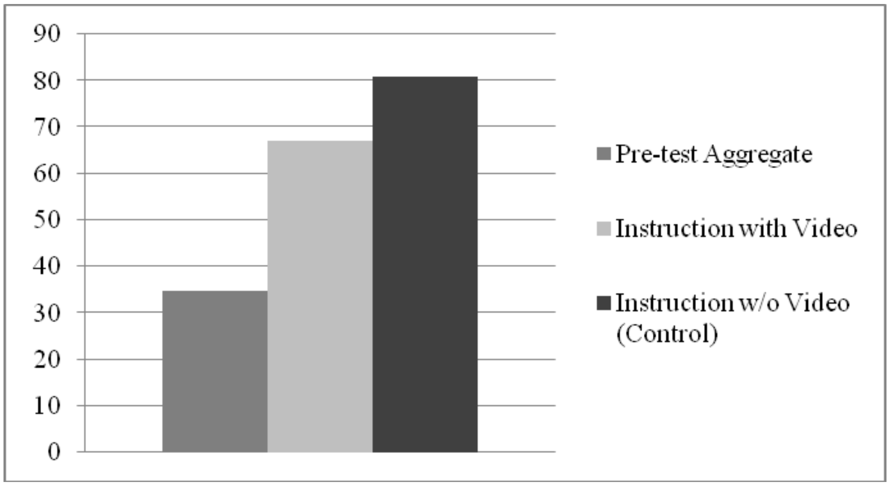


Figure 4. Experimental and control group final grades.

Figure 5 displays a comparative chart of the four experimental lessons using incremental media. During each lesson, both groups received a pre- and post-test for assessment. The control group scored higher than the experimental group on 3 of the 4 days. Both groups show pre- to post-test score improvements. Overall, the media-supplemented classes scored much higher from pre- to post-tests. The experimental group averaged a 27 percent increase in post-test scores, while the control group averaged a 15.25 percent increase. Whether or not these results support or reject a hypothesis will be discussed in the conclusion section.

Assignment	**Instructional Interval Length for Experimental group**	**Groups**	**Pre-Test Averages**	**Pre-Test Group Differences**	**Post-Test Averages**	**Post-Test Group Differences**	**Pre- to Post-Improvements Per Group**
Hitler and Chamberlain	5 minute	Control Exp.	60 52	Control +8	83 79	Control +4	+23 +27*
The Way We Live	10 minute	Control Exp.	48 20	Control +28	77 65	Control +12	+29 +45*
Stalin	15 minute	Control Exp.	50 51	Experimental +1	58 71	Experimental +13	+8 +20*
Lawrence of Arabia	Over 30 minutes	Control Exp.	79 64	Control +15	90 80	Control +10	+11 +16*

Figure 5. Experimental vs. control group pre-quiz/post-quiz scores. *Denotes the larger improvement from pre- to post-test.

Teachers were surveyed upon the completion of this research project.

Conclusion and Recommendations

Conclusions

This study suggests several interesting findings regarding video-media supplementation for social studies classrooms. The first hypothesis states that experimental group participants will be more receptive to video-instruction during the study than the control group. This hypothesis is supported by 4 days of formative assessment (Appendix H) and self-report (Figure 2). Unfortunately, it is not supported in terms of real scores and scholastic improvements. Figure 4 displays low pre-test data for both the experimental and the control groups. However, at the end of the unit study, the control group—those without media-supplemented lessons—performed more favorably, overall, with scores in the low 80s compared to an average of 67 for the experimental group. This suggestion appears contrary to the overall purpose of the study, which was to maximize academic achievement in relation to state specified standards. Since the average score for the experimental group is failing, the second hypothesis should be rejected. Teachers cannot ensure adequate learning if media-supplemented instruction does not yield nominal results. However, the first hypothesis states that students will merely be receptive to the information given to them during the study via media presentation. Heightened reception to new information through media-instruction is supported (see Figure 2). Although students may be receptive to the material, they may not be applying the necessary higher-order thinking skills to understand the given concepts.

Only once did an experimental group out-score a control group in a post-test. The media-supplemented group actually scored lower on the majority of the assessments. The participants reported that they were confident with video-media instructional methods, and actually reported a higher-level of learning with video-aid; however, the conclusion is that their scores were actually lower than the control group. Perhaps some of the differences are attributable to the method of instruction; yet, the large improvements from pre- to post-test scores suggest that the problem may lie within the sample. The experimental method was effective in increasing the lowest achievers' scores more than the scores were improved in the control group (suggested from Figure 5). Since assessment methods (like those found in Appendix D, parts I and II) are primarily identical, and careful planning went into ensuring equal access to information, despite differentiated instruction, there is strong evidence that media may impact low-level achievers more so than other methods. Also, the higher increase in post-test scores suggests a positive impact of media-aided instruction in the short-term. The comment was made on one teacher survey that low-achievers, specifically, can improve their understanding. This study appears to support that experience-based claim.

The second research question, regarding methods of media-aided instruction that may improve learning according to state standards, is not fully supported by this study. Although, this study does provide data that supports student perception to the method of media-supplemented instruction, it does not provide reliable evidence that any combination of incremental instruction and instructional method will adequately meet state performance indicators. The experimental group received media-guided instruction for only 4 days, but there were more assessments made on these days that factored into their final grades than on regular class days because of pre- and post-test assessments. The experimental group, on average, scored below the school's passing level (see Figure 4). Yet, variables such as extreme outliers in the class did bring the average down. Also, students may have developed a sense of helplessness on the days of video-instruction if their primary learning style was not being represented. For example, on one day, there was a 60-minute period of absolutely no teacher interjection to ensure that the group was keeping up with the new information. Obviously, this does factor against the final grade, and is not evident in the unusually high pre- and post-test scores for that lesson (see Figure 5).

The third hypothesis is supported by this research study. However, the question is not as simple as it appears on the surface. The participants of this study favorably ranked the media-supplemented instruction. Given high rankings, without adequate academic scores needed for funding and public support, the social studies may actually be hindered by the influx of technology in education, unless it actually increases student content knowledge. Teachers are perceived more favorably when they use media instruction (see Figure 2), and, for this reason, they will continue to apply the latest in educational technology and instructional methods. However, unless adequate time is invested on the part of the educator to plan and prepare lessons with various activities, in addition to the presentation of media, then scores will continue to decline, and, with them, student subject comprehension. Incorporating strategies, typing notes for student comprehension, and, perhaps, handouts, including discussion or essay questions found in Appendix E, are all crucial for student success. Generally, this study supports the notion that differentiating curriculum is necessary for academic successes.

This study supports the benefits of media-instruction through reports of large increases in pre- and post-tests. However, video alone will not increase content knowledge in the long-term. Previous research suggests that media increases the amount of knowledge a person holds in memory, but the lesson, as a whole, is what determines whether or not the concept will be remembered. The control group in the study had high marks because their instruction was filled with group readings, self-study, and slightly more writing than the experimental group.

Although, there were reported academic differences between the groups, this study suggests that media enhancement does not guarantee increased academic performance.

Recommendations

This action research plan should lend valuable insight for further curriculum planning. In addition, it may motivate teachers and students alike to explore the possibilities and limitations of technology on learning and society. Students' abilities to process information are considerably different at each grade level. Yet, this variation is less well hidden in the early grades, which makes this action research project more difficult since the focus is on secondary-level learners. Students, of all ages, shift attention frequently. Kozma's research cites that, on average, while watching television, students shift their attention from the screen to other activities going on around them at a rate of 100-200 times per hour (1991). In order for teachers to make use of frequent shifts of focus, they must monitor the content of video-instruction and their own teaching methods. A short video clip (10-15 minutes), followed by verbal instruction, and the process repeated, should allow a natural flow of focus from teacher to video to teacher without straining young attention spans. Yet, individual differences exist in the classroom, and should be taken into account.

Several constraints exist in the current research. One limitation to this study is that most topics popularly covered via video are topics that have been produced for opportunity of profit. Often, the educational quality of such media is poor, and much consideration should be given before a media source is deemed reliable or valid for the classroom. Educators know that historical content is often skewed by its author(s). Throughout American history, for example, most referenced historical content has been documented by white males. Therefore, accounts are fundamentally biased and limited. Even the topics which are covered in curriculum are restricted to what is considered widely read historical facts; when, in fact, these topics are merely collective vantages from one popular opinion. Thus, it is important to use technology such as internet media-streaming to find video supplements on topics that were not produced to appease the American audience, but were created with a focal point of truth. This study does not consider Internet media, and the advantages and disadvantages of free and easily-accessible streaming media.

Additionally, this research was constructed by a future educator with limited classroom experience. Limited experience in the classroom restricts knowledge of questions pertinent to education in a particular field. Future research should assess the impact of technology via various mediums. Today, students in public high schools can be viewed checking homework assignments online from their cellular phones without leaving the classroom. Perhaps a more fundamental question to research is the impact of online sources on social studies, or the effects of pairing various media-supplements with differing instructional methods.

Despite research supporting several advantages to visual-instruction supplementation, television is by no means an alternative to reading or lecture methods that have been effective in education for hundreds of years. Students with low reading abilities might naturally favor television over reading texts. A sample of sixth graders was studied to assess the potential of educational television versus reading about similar content. Kozma noted that television watchers put forth less effort; yet, both groups scored the same scores on a comprehension test (1991). However, the same study notes better inferences made by the reading group. A limitation of this action research plan is that literary research was mainly restricted to video instruction in history classes. Also, the action plan, itself, is specifically constructed for high school social studies classes. Yet, the practice of segmented video-instruction should be applicable to other subjects whereas content related videos are available.

Flood & Lapp (1995) addressed several key arguments against video-media instruction. The argument that television displaces reading is a popular misconception. Their research suggests that there is no overall effect of viewing television on academic performance, unless more than 40 hours per week are viewed. Clearly, this experiment does not nearly approach that amount of time in front of the television. The second argument they address is that television viewing negatively affects young readers. Readers, aged 5-8, were assessed. Several did appear to experience concentration deprivation to some extent; however, genetic and environmental factors were not taken into account. Finally, the argument that viewing television restrains language development was also addressed. The researchers proposed that media supplementation may help develop young people's various speech patterns, and improve their understanding of culture systems of communication, thereby enhancing language development (Flood & Lapp, 1995). As mentioned previously, the content of the supplement is a far better predictor of academic success than the amount of time spent watching it.

Future application of media-supplemented instruction should consider the advice of professionals with experience, in addition to these findings and related literature. According to teacher-participants in this study, media-aided instruction may appear to be a crutch for unprepared educators. Students are reported to tune out unless specific assignments are tied to the visual; also, students are likely to substitute video for text, entirely. A biology teacher suggested using 10-20-minute periods of instruction, in addition to handouts on topics covered by the media. This research found that students favor similar methods for their own learning.

The teaching profession, like all others, will perpetually be evolving with the latest technology. Educators must continue to include new technologies in the classroom in order to promote engaged learning, and to maximize the efficiency and effectiveness of limited resources. Subjects such as the social sciences which educate young people for their role as active citizens must incorporate technologies wisely. The video-supplemental instruction method has the potential to inspire classroom debate, strengthen lectures and readings, and project information in an interesting way. Successful implementation of this method should augment student understanding, accommodate various learning styles, and enhance student motivation to learn.

References

Anderson, J. A. (1983). Children’s understanding of television: Research on attention and comprehension. *Television literacy and the critical viewer*. New York: Academic Press.

Baker, S. K., Dimino, J., Gersten, R., Peterson, A., & Smith-Johnson, J. (2006). Eyes on the prize: Teaching complex historical content to middle school students with learning disabilities. *Exceptional Children, 72*, 264-280.

Deng, H., & Zhang, S. (2004). Perception of learning effectiveness in the multimedia classroom vs. the traditional classroom: A case study. *College and University Media Review, 11*, 87-107.

Flood, J., & Lapp, D. (1995). Television and reading: Refocusing the debate. *The Reading Teacher*, *49*(2), 160-164.

Golden, M. (2004). Technology’s potential, promise for enhancing student learning. *Technological Horizons in Education, 31*(12), 42-43.

Grunwald Associates. (2002). Video and television use among k-12 teachers. Report prepared for PBS.

Jordan, D. L., & Sanchez, P. M. (1994). Traditional versus technology-aided instruction: The effects of visual stimulus in the classroom. *Political Science and Politics*, *27,* 64-67.

Kozma, R. B. (1991). Learning with media. *Review of educational research*, *61*(2), 179-211.

Marshall, J. M. (2002). Learning with technology: Evidence that technology can, and does support learning. *Cable in the classroom.*

Radtke, P. H., Stern, H. W., & Wetzel, C. D. (1994). *Instructional effectiveness of video media.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Ranker, R. (2000). Raised floors solve the university's connectivity challenges. *Communication News*, *37*(12), 36-37.

Rideout, V. J., Vendewater, E. A., & Wartella, E. A. (2003, Fall). Zero to six: Electronic media in the lives of infants, toddlers, and preschoolers: a Kaiser family report.

Appendix A: Initial Survey

My learning code is: _____
Do not write your name on this survey. There are two pages please answer all of the questions.

1. My gender is:
   - Male
   - Female
2. My age is:
   - 12-13
   - 14-15
   - 16-17
   - 18 or above
3. Do you consider yourself:
   - American Indian/Alaska Native
   - Asian/Pacific Islander
   - Black, non-Hispanic
   - Hispanic
   - White, non-Hispanic
   - Other
4. For purposes of this survey, I am primarily a student in:
   - A middle school.
   - A high school.
5. During the week I spend ____ hours reading.
   0-1 2-3 4-5 6-7 8 or more
6. Do you enjoy reading for pleasure more than watching videos?
   _____ Yes _____ No
7. During the week I spend ____ hours watching DVD's, videos or television.
   0-1 2-3 4-5 6-7 8 or more
8. Do you ever spend time talking to friends about the videos or documentaries that you watch?
   ____ Yes _____ No ____Sometimes _____ No usually
9. I think that I learn best by:
   Reading alone Reading in groups Watching video Listening to my teacher
   Watching video and listening to comments made by teacher
10. Before video-instruction class time, my history teacher seemed to:
    Strongly dislike teaching Mildly dislike teaching Not care about teaching Mildly like teaching Strongly like teaching

Appendix B. Initial Survey Data for Both Groups

People	**Age**	**Ethnicity**	**Weekly Reading Hours**	**Weekly Media Hours***	**Satisfaction: Reading vs. Video**	**Students' Preferred Learning Styles**	**Perceived Teacher Satisfaction**
Males			*Min-Max*	*Min-Max*			
A23	18	B	4-5	8	Video	Watching and instruction	2
L5	18	B	4-5	6-7	Video	Reading in Groups	2
D22	18	B	8	8	Video	Reading in Groups	2
R50	18	B	0-1	8	Video	Watching video	1
J9	18	B	0-1	8	Video	Watching and instruction	2
D1	16.5	B	2-3	6-7	Video	Watching and instruction	2
J7	18	B	4-5	4-5	Video	Reading in Groups	1
V6	18	B	0-1	2-3	Video	Watching and instruction	2
WC23	17.5	B	4-5	8	Video	Reading in Groups	4
J16	16.5	W	0-1	2-3	Video	Watching video	1
J10	16.5	B	0-1	8	Video	Watching and instruction	1
T24	16.5	B	0-1	8	Video	Watching and instruction	1
A16	16.5	B	0-1	6-7	Video	Reading in Groups	1
N100	16.5	B	2-3	4-5	Video	READING	1
L24	16.5	B	0-1	8	Video	Watching and instruction	1
A4	16.5	B	2-3	4-5	Video	Watching video	2
D2	16.5	B	0-1	8	Video	READING	1
K34	16.5	B	0-1	2-3	Video	READING	1
Females							
C0	16.5	B	0-1	4-5	READING	Watching and instruction	1
D44	18	B	0-1	8	Video	Watching and instruction	1
C27	18	B	8	8	READING	Reading in Groups	2
C18	18	B	0-1	8	Video	Watching and instruction	4
L27	18	B	0-1	6-7	Video	Watching video	1
M12	18	B	0-1	8	Video	Watching and instruction	2
R0	16.5	Other	0-1	4-5	Video	Watching video	2
S7	18	B	4-5	6-7	Video	Watching video	1
A18	18	B	0-1	8	Video	Watching and instruction	2
D0	16.5	B	0-1	2-3	Video	Reading in Groups	2
J0	16.5	B	2-3	8	READING	Listening to instruction	1
C10	16.5	B	0-1	4-5	Video	Reading in Groups	2
N6	15.5	B	0-1	4-5	Video	Watching video	1
KA31	16.5	B	0-1	4-5	READING	Listening to instruction	1
J23	16.5	B	0-1	0-1	Video	Watching and instruction	1
T3	15	B	4-5	4-5	Video	Reading in Groups	1
B92	15	B	2-3	4-5	Video	READING	4
T10	16.5	B	0-1	2-3	Video	Watching and instruction	1
B0	17	W	8	0-1	Video	Watching and instruction	1
Totals:	**16.9**	**37**	**2 h 3 min**	**5 h 42 min**	**4:33**	**Listening to teacher 2**	**Mildly**
					0:18	**Reading alone 4**	**dislike 3**
Males	**17.1**	**18**	**2 h 9 min**	**6 h 15 min**		**Watching video 7**	**Mildly**
					4:15	**Reading in groups 9**	**like 13**
Females	**16.9**	**19**	**1 h 57 min**	**5 h 9 min**		**Watching video/**	**Strongly**
						teacher comments 15	**like 21**

Source: Student Survey *Data excludes internet media **Only participants reporting responses are listed

Appendix C. Follow-up Survey

My learning code is: _____
Do not write your name on this survey. There are two pages please answer all of the questions.

Please check one response for each of the questions 1-8.

1. My gender is:
   - ☐ Male
   - ☐ Female
2. My age is:
   - ☐ 12-13
   - ☐ 14-15
   - ☐ 16-17
   - ☐ 18 or above
3. What ethnicity do you consider yourself:
   - ☐ American Indian/Alaska Native
   - ☐ Asian/Pacific Islander
   - ☐ Black, non-Hispanic
   - ☐ Hispanic
   - ☐ White, non-Hispanic
   - ☐ Other
4. The likelihood that I will enjoy other subjects that use video-instruction in the future is:
   - ☐ definitely not
   - ☐ probably not
   - ☐ probably yes
   - ☐ definitely yes
5. The teacher did a better job teaching class with video-lecture materials than he does regularly without it.
   - ☐ Yes
   - ☐ No
6. How often should the video be stopped for a review of what it has covered in order for you to learn the most that you possibly can?

   _____ Not at all

   _____ 1 time every 5 minutes

   _____ 1 time every 10 minutes

   _____ 1 times every 15 minutes

   _____ 1 time every 30 minutes

7. Rate the strategies 1-5 to tell what strategies help you to best understand what the video is talking about?
   1 the one that is MOST helpful, 5 being the one that is LEAST helpful

   _____ Teacher pausing video every once is awhile to explain

   _____ Writing notes that teacher hands-out

   _____ Writing my own notes

   _____ Reading something related to the video before or after we watch it

   _____ Talking to my classmates afterwards about the video

8. The teacher did a better job teaching class with video-lecture materials than he does regularly without it.
   - ☐ Yes
   - ☐ No
9. How often should the video be stopped for a review of what it has covered in order for you to learn the most that you possibly can?

   _____ Not at all

   _____ 1 time every 5 minutes

   _____ 1 time every 10 minutes

   _____ 1 times every 15 minutes

   _____ 1 time every 30 minutes

10. Rate the strategies 1-5 to tell what strategies help you to best understand what the video is talking about?
    1 the one that is MOST helpful, 5 being the one that is LEAST helpful

    _____ Teacher pausing video every once is awhile to explain

    _____ Writing notes that teacher hands-out

    _____ Writing my own notes

    _____ Reading something related to the video before or after we watch it

    _____ Talking to my classmates afterwards about the video

Appendix D: Part I. Five-Minute Incremental Lesson and Assessment

World History: European Nationalism
Video Quiz
Hitler's New Germany:

1. The Nazi Party was the common name for ____. Its political leader was Adolf Hitler.
2. The world was experiencing an economic _____________________ and jobs were scarce.
3. Germany was dissatisfied with their role in Europe following
4. Following World War I, name one effect the Treaty of Versailles had on Germany ____.
5. In August of 1932 President Hindenburg died and Hitler declared himself Fuehrer and _________________________.
6. Hitler called German troops into ___________________________which was supposed to be a neutral border between Germany and France.
7. Hitler disregarded the Treaty of _________________________, and by doing so the Germans knew they could no longer be ignored.
8. What is the significance of Nationalism and Totalitarianism in Europe after WWI? ____ ____.
9. Was this video helpful for your understanding of Hitler's idea for Germany after the First World War? Yes or No and Why: ____ ____
10. On a scale of 1 to 10 (1 no understanding, 5 being some idea, and 10 being very well) rank your level of understanding on this subject now: ________________
    What was your level understanding before: ________________

Chamberlain: Hitler is Man of Peace

1. In 1938 Hitler is now planning on expanding Germany to include __________________________ ____.
2. Why did Hitler arm Austrian citizens? ____ ____.
3. How was the German army greeted when they came into Austria? ________________________ ____.
4. Who was Neville Chamberlain? ____.
5. What did he declare that the Munich Agreement meant when he returned to his home country? ____ ____
6. How do you think the people of Britain and France felt about allowing Hitler to take back the Sudetenland in their agreement? ____ ____
7. What is the significance of Nationalism and Totalitarianism in Europe after WWI?
8. What does this video tell us about the situation in Europe prior to the Second World War? ____ ____
9. Do you think that Hitler will be willing to go through with his plan? What might be some barriers to creating a new German nation? ____ ____ ____ __________________________________
10. On a scale of 1 to 10 (1 no understanding, 5 being some idea, and 10 being very well) rank your level of understanding on this subject now: ________________

What was your level understanding before: _______________

Appendix D: Part II. Five-Minute Incremental Lesson and Assessment

Lecture Quiz
Hitler's New Germany:

1. The Nazi Party was the common name for ____. Its political leader was Adolf Hitler.
2. The world was experiencing an economic _____________________ and jobs were scarce.
3. Germany was dissatisfied with their role in Europe following
4. Following World War I, name one effect the Treaty of Versailles had on Germany ____.
5. In August of 1932 President Hindenburg died and Hitler declared himself Fuehrer and _________________________.
6. Hitler called German troops into ___________________________which was supposed to be a neutral border between Germany and France.
7. Hitler disregarded the Treaty of _________________________, and by doing so the Germans knew they could no longer be ignored.
8. What is the significance of Nationalism and Totalitarianism in Europe after WWI? ____ ____.
9. Was this video helpful for your understanding of Hitler's idea for Germany after the First World War? Yes or No and Why: ____ ____
10. On a scale of 1 to 10 (1 no understanding, 5 being some idea, and 10 being very well) rank your level of understanding on this subject now: ________________
    What was your level understanding before: ________________

Chamberlain: Hitler is Man of Peace

11. In 1938 Hitler is now planning on expanding Germany to include __________________________ ____.
12. Why did Hitler arm Austrian citizens? ____ ____.
13. How was the German army greeted when they came into Austria? ________________________ ____.
14. Who was Neville Chamberlain? ____.
15. What did he declare that the Munich Agreement meant when he returned to his home country? ____ ____
16. How do you think the people of Britain and France felt about allowing Hitler to take back the Sudetenland in their agreement? ____ ____
17. What is the significance of Nationalism and Totalitarianism in Europe after WWI?
18. What does this video tell us about the situation in Europe prior to the Second World War? ____ ____
19. Do you think that Hitler will be willing to go through with his plan? What might be some barriers to creating a new German nation? ____ ____ ____ __________________________________
20. On a scale of 1 to 10 (1 no understanding, 5 being some idea, and 10 being very well) rank your level of understanding on this subject now: ________________
    What was your level understanding before: ________________

Appendix E: 10 Minute Video Increments Handout

The Way We Live: Rise and fall

"Changes in Fresno"

Follow along with the video and answer the following:

1. Fresno, CA is best known for its ________________________, and is named after a type of tree.
2. In the __________downtown Fresno began to erode.
3. The freeway system was built in the 1970's and 1980's.
4. The creation of _____________________ruined the Sierra _____________________.
5. Beijing is also experiencing rapid growth. Cities damage ___________________________.
6. The United States has eliminated _________ paint. Developing countries like ___________ have not taken measures to do so.
7. _______________ in Brazil affect all of South America, just as Chinese air pollution affects the U.S.
8. _______________ plays a major part as successful people want to live in developed countries.
9. Bangladeshis attempt to get into ___________ and get thrown back by the Indian government, because there are already over one billion people living in India.
10. Social security debates bring up concerns about ___________ growth in the U.S.
11. 2,000 years ago the world population was only ______ million. Today there are that many people living in the U.S.
12. In the 1920's there were ____ billion people living in the Earth.
13. With a ____ % growth rate the world population would double in just _____ years.
14. ______ billion people are expected to be living in the Earth by the year __________.
15. New York City's population decreased by _____% in a ten year period.
16. Cities are considered _______________ centers, and places of excitement.
17. (Circle one) There are *more* or *less* farmers in Fresno, CA today than there were thirty years ago?
18. (Circle one) _______________________ prices may cause people to move back downtown.
19. Did the woman in the video like living in Fresno? *Yes* or *No.*
20. Would you live in downtown Chattanooga if you could afford it? *Yes* or *No?*

Upon reflection proceed to answer the following on a piece of paper:

1. Why did it become difficult for people to walk around in Fresno?
2. What changes took place in downtown after people began moving to distant suburbs?
3. How have population changes effected the environment and the culture in Fresno?
4. How can cities impact the environment less?
5. Define mortality and fertility. How are these rates effecting the population growth rate?
6. What makes it possible for people to live in harsh environment like deserts in Nevada today?

Appendix F: 10 Minute Video Increments and Control Assessment

Pre-Post Test on Population Growth:

1. Which is a factor of population growth?
   a. Increased crime rates
   b. Increased fertility rates
   c. Increased mortality rates
   d. Suburban sprawl
2. Fresno’s freeway system was built from:
   a. 1940-1950
   b. 1980-1990
   c. 2000-2010
   d. 1970-1980
3. Today there are over: _____ billion people living on Earth.
   a. 3 billion
   b. 900 million
   c. 300 million
   d. 6 billion
4. Debates about social security in the United States bring up talks about _______:
   a. Population growth and the effects on healthcare
   b. Population decline and the effect on the environment
   c. Pollution rates and the effect on the atmosphere
   d. Real estate prices
5. Population in the world’s countries is _______:
   a. Decreasing in underdeveloped nations
   b. Staying about the same everywhere
   c. Increasing in underdeveloped nations
   d. Poorer in developed nations

Appendix G: 15 Minute Video Increments Handout

Europe and Russia: Stalin's Leadership

a) Hitler was the chancellor, or fuehrer, of Germany. His military occupied the Rhineland in 1936, a move they were ordered not to make by the Treaty of Versailles. This treaty followed which war? : ___________________________

b) _______________ was a power hungry leader in Russia during this time.

c) This man had his breakfast served at _______ doors. He would come out of a different one each day so that nobody knew his next move.

d) Arrests were made for particularly no reason. The woman interviewed was placed in a children's home when her _____________was taken away to prison.

e) The "Little Kulaks" were another name for Russian ____________, or farmers.

f) Fascism and Communism were opposing ideals in Europe. The two ideals faced off when _____________and Russia went to war making an effort to gain Spain's support of their ideals.

g) The victory went to Franco the Spanish dictator. But millions of Russians were convinced to join the ______________________party as the threat of war looms.

h) One of the NKVD's secret burial ground there were _______________ bodies found.

i) Hitler's Germany annexed or added Czechoslovakia.

j) Which country attacked the "backdoor" of Russia from the Far East? _________________

k) The _________________ line was a heavily defended line between France and aggressive enemies.

l) Although Germany and Russia do not agree on their ideas for society, they decide to make a treat. However, it is proven to be too little too late because Hitler had already made plans to invade Poland.

m) The agreement that was made between Germany and Russia really divided _____________into two halves, one for Germany the other for Russia.

n) _________________the Russian leader and _________________Germany's military leader were both in secret agreement to divide the Balkan states.

Appendix H: Formative Assessments for Experimental and Control Groups

Formative Assessment of Video Instruction:
This assessment form will be filled out by the cooperating teacher as the instructor gives the lesson, or by the instructor at moments when no instruction is needed.

Topic: ____ Date: __________________________

Check if most students are displaying the given behavior during video instruction session:

____ Students have heads up and are watching the video

____ Students are taking notes on the video

____ Talking is constructive and prompted at given point by the teacher

____ Students were asking questions and participating in class discussion after the video

____ Students are engaged in what the teacher is saying during the video

____ Check if you, as an instructor, would you recommend the video to another teacher?

____ Check if you would use this video again to supplement this material.

____ Check if you agree that students would be more engaged in a direct lecture format rather than the video

Formative Assessment of Lecture Instruction:
This assessment form will be filled out by the cooperating teacher as the instructor gives the lesson, or by the instructor at moments when no instruction is needed.

Topic: ____ Date: __________________________

Check if most students are displaying the given behavior during video instruction session:

____ Students have heads up and are engaged in the lecture

____ Students are taking notes during the lecture

____ Talking is constructive and prompted at given point by the teacher

____ Students were asking questions and participating in class discussion

____ Students are engaged in what the teacher is saying

____ Check if you, as an instructor, would you recommend this lesson plan to another teacher?

____ Check if you would use a video to supplement this material, or leave unchecked if you think the material stands on its own.

___ Check if you agree that students would be more engaged in a video rather than the direct lecture

Appendix I: 30 Minute Video Increments Handout

Activity:

View Lawrence of Arabia: The Making of the Modern Arab World, Part I (60 minutes). As you view the film answer the following questions and be prepared to discuss after the viewing.

1. How did Lawrence's experiences as a young boy, student and archaeologist affect his role in the Middle East?
2. What were the benefits and drawbacks for Lawrence traveling in the Middle East?
3. How did technology and advances in engineering during the early twentieth century affect the Arab cause during WWI? e.g. guns/ammunition or transportation routes

Lawrence of Arabia was a leader, a hero and a celebrity who became a legend through the propaganda of American journalist, Lowell Thomas. As a class, discuss what propaganda is, and how and why it is used in times of war. View documentary: 0-4 mins. (Part I) & 30 mins (Part II).

Create working definitions for 'leader', 'hero', 'celebrity' and 'legend'. Discuss whether or not Lawrence of Arabia meets your class definitions. Have students create propaganda posters or stories identifying Lawrence as a leader, hero, legend or none of the above. Next, compare in writing the military and political leadership of World War I - compare and contrast leaders and their strategies; assess their immediate and long-term success.

Assessment:
Participation in film discussion, completion of propaganda poster showing opinion and completed essay for content and writing mechanics.

Appendix J: Teacher Survey

Please Answer the Following:
1. What subjects do you currently use video/dvd supplementation in? ___________________________________

2. How frequently do you use the technology in your lessons? (Circle One): Daily Weekly Monthly Never

3. Are your students more or less receptive to information presented via video? (Circle One): More Less n/a

4. Does video improve your students' self-perceived learning abilities? (Circle One): No Yes Unsure
Please comment on how video may improve or harm their level of interest and achievement: ________________
____
____

5. Have you used videos that are relevant to state or local educational standards? (Circle One): No Yes n/a

6. Have you found video instruction to improve the students understanding of the content related to your subject? (Circle One): No Yes n/a

7. Please list useful strategies you have used for incorporating video instruction into the classroom: ___________
____
____

8. List one negative aspect of video supplemented instruction: ____
____

9. List one positive aspect of video supplemented instruction: ____
____

Body Language: Inclusion of Body Awareness and Literacy in Physical Education

Lex Oren

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-106.

Introduction to the Problem

Children that are unable to read at or above grade level by the third grade are less likely to succeed in academics in later years. Currently, students in many Tennessee public schools are excelling in reading; however, many students are well below the desired standard set by the No Child Left Behind Act. Another issue is that Tennessee is the fifth most obese state in the United States. This is a problem that is beginning to reach pandemic proportions. Childhood obesity is on the rise, as well as childhood diabetes.

There are two important issues at hand that may be viewed as problems; however, the investigator views these issues as opportunities rather than problems. The task at hand is twofold. First is to raise literacy standards so children are reading at or above grade level by the end of the third grade. Second is to increase awareness of the lack of physical fitness in many children's lives today, with the intent of having children interested in moving in order to raise their level of physical and mental health.

After administering the Presidential Physical Fitness Test to all first through fifth graders at a local, public elementary school, only five students attained the Presidential level of the test. Fifty students achieved the National level, and the remaining 407 were listed at the Participant level. The guidelines listed on The President's Challenge (n.d.) Web site indicate that the Presidential level is indicative of the top 10 percent of the nation. The National level is correlated to the top 50 percent and the Participant level is the bottom 50 percent. The school that was tested had its top students represent the top one half of a percent at the Presidential level, top ten percent of the students at the National level and remaining eighty nine and a half percent of the students at the lower, Participant level. The investigator's conclusion was that the students in this school are below average when compared to the standards set by the Presidents Council.

The school's TCAP scores and TVASS scores in literacy are currently at a "B" grade in accordance with the Tennessee Department of Education's Report Card. This is unacceptable, especially when the Tennessee standards are well below that prescribed by the federal standards. The No Child Left Behind Act gives no mention to physical education. With this lack of awareness and enforcement to health, standards and curriculum are left to the states to determine. The potential problem with this is that there is no direct emphasis to incorporate literacy, mathematics, and history into the physical education arena. The possibilities are endless when educators are motivated to make a difference. Currently, Tennessee requires 90 minutes of physical fitness per week for elementary school children. The Center for Disease Control recommends 1 ½ hours per day of vigorous exercise for youth.

The researcher has designed an action research project that incorporates utilizing body manipulation, locomotion skills, and basic literacy skills to further develop and enhance physical fitness and emergent literacy. The purpose of this study is to examine the potential development of literacy through phonics and psychomotor, manipulated body movements in students ranging in age from 5 to 6 by reinforcing basic rules for reading by recreating letters with the student's body. The intent is to focus on two-letter sounds known as diagraphs and diphthongs. An example of this is the "TH" sound. This is the sound that is made when each letter is not pronounced individually, but when the two letters are combined to make a different sound.

Limitations

There are a few variables that may affect this study. The first variable is that the school is composed of different socioeconomic statuses. There are also language barriers that should be considered. Many students in the investigated school are enrolled in the English as a Second Language curriculum. These students speak languages such as Chinese and Arabic in their homes. These language barriers will cause a distinct outlier in the data review. All students are tested physically, including students with physical and mental disabilities. This practice is designed to include students with disabilities in the same classrooms with other students. The final variable is that many students came from different pre kindergarten programs that taught different levels of literacy; therefore, many students enter the kindergarten grade with different backgrounds in literacy.

Research Questions

- Do locomotor skills, body manipulation, and body awareness assist in literacy development?
- Do kinesthetic exercises assist retention of new information?
- Do students recognize phonemes?
- Do students know the sounds associated with each letter of the alphabet?
- Are students able to visualize letter shapes without cues from the instructor?

Review of Literature

The state of Tennessee has curriculum standards listed for kindergarten to second grade, and third to fifth grades. These curriculum standards address developing fine and gross motor skills, space awareness, the fundamentals of striking a ball, and outdoor appreciation. The great opportunity for educators and administrators in the future is going to be developing a form of inclusion that incorporates the language arts and mathematics into physical education.

Physical educators are becoming aware of the need for the implementation of additional reading, geography, science, and math skills. This is evident when physical educators attempt to share lesson plans via the World Wide Web. There are numerous Web sites that share information for the sole purpose of distributing lesson planning tools to educators. One such web site is http://www.pecentral.com/. This Web site offers lesson plans for all sorts of activities and ways to incorporate literacy into physical education activities (PE Central, 2007).

Many teachers are recognizing the importance of preparing students for the classroom. Kelly McGonigal has taken a literal approach to this idea. McGonigal (2007) has started to teach restorative yoga to her students. Her intent was to help her students relax before going back into the classroom environment (McGonigal, 2007). This is an example of how physical educators are stepping outside the norm of teaching traditional physical education to students. Many classroom educators and administrators want to see children engaged to the point that the students expend much of the energy with which they came to school. The investigator agrees that students need to expel this surplus of energy to assist them in calming down; however, exercise to the point of exhaustion may lead to poorer attention spans in the classroom. McGonigal's idea of assisting students to regain focus is one method for success in a learning environment.

Similar to McGonigal's study on teaching restorative yoga is the study conducted by Heather Peck, Thomas Kehle, and Melissa Bray using yoga as an intervention for children with attention problems. Like McGonigal, Peck et al. are using yoga to help regain focus in students in a classroom environment. The study involves students with attention disorders, learning disorders, and specifically ADHD (Peck, Kehle, & Bray, 2005). The correlation between teaching yoga to students and literacy in physical education is that physical education teachers are using nontraditional methods to influence classroom learning and behavior. The idea that physical education can influence classroom learning is becoming more and more prevalent. The investigators intent is to use the inverse; introduce traditional classroom content into the physical education arena.

A developmentally appropriate practice (DAP) stresses the concurrent development of social, emotional, physical, and intellectual growth in school age children. Morrow states, “incorporating DAP in early literacy instruction involves making sure that literacy and development is evident throughout the school day, including thematic instruction when literacy and content information are integrated, and sometimes allowing students to be playful” (Morrow, 2004, p. 88). This is a powerful statement that can be inversely correlated to physical education. Physical education should be fun. The ability to play to reinforce and incorporate literacy fundamentals is an idea that should be included to ensure a balanced education experience in children that will also foster the teachings of living a healthy lifestyle.

“Principals who understand the nature and needs of young children can raise the level of their early childhood programs by emphasizing outdoor playtime and providing enthusiastic support for teachers who are warm and encouraging, who help young children resolve personal problems, and who can make learning meaningful and fun” (Greenberg, 2005, p. 27). This key concept of having a supportive administration that encourages physical educators to incorporate related arts into all aspects of children’s learning to make it more fun and entertaining, and less like work, is, by design, going to have positive effects on literacy.

Children learn to read by reading. There is no standard that states that reading should not be implemented into physical education. The idea is to place the reading as a by-product of the lesson so children are not aware that they are spending less time playing games. Boundaries that separate home and school are becoming wider with working families and busy lifestyles. “Families and school personnel need to focus on literacy and physical fitness to make changes in two important areas in relation to the lives of children in this country” (Richardson, Richardson, & Sacks, 2006, p. 129). Ideas are listed to address the two outlying issues that face the United

States. Literacy and physical fitness are not combined like the investigator intends to accomplish, but ideas are addressed to achieve maximum awareness of the issues to the community. Richardson et al. propose to incorporate literacy bags into the curriculum. These bags contain books with specific themes. Themes include “books and balls” that have several books with stories about famous athletes and their stories. They called this the “father-son book club,” (p. 131) with the intent of developing a yearning to participate in athletic events.

An underlying theme is that this father-son book club also recognizes the importance of families first, where there is an emphasis on having both parents available with the children. “Children from homes where parents model the uses of literacy and engage children in activities that promote basic understandings about literacy and its uses are better prepared for school” (Strickland, 2004, p. 86). Strickland goes as far as incorporating the Scouting programs into literacy and fitness programs.

Dance is another form of movement that offers exponential benefits in relation to physical fitness. This type of psychomotor and locomotor movement can also be combined to teach literacy (Birch, 2000). Birch argued that dance incorporates all eight multiple intelligences (linguistic, logical-mathematical, spatial, bodily kinesthetic, musical, interpersonal, intrapersonal, and naturalist).

Furthermore, dance also enhances memory, analysis, creativity, and practicality (Birch, 2000). These are similar traits that are required for emergent literacy. The basis of dance begins with body awareness, body manipulation, and space awareness. The ability to learn, develop, and master these fundamental skills at an early age will only enhance future athletic potential. To introduce literacy with these skills may enhance both disciplines.

A University of Tennessee at Chattanooga professor, Dr. K. Cowan, described using semiotic representations as a literacy tool. “Students must have experiences in which they construct and translate meaning across sign systems through what we call semiotic representations. When students represent meaning semiotically, they demonstrate knowledge of and facility with communication systems including art, language, math, drama, and dance” (Cowan & Albers, 2006, p. 124). Essentially, making connections through various sources or tools can enhance metacognitive strategies that include visualizing, making connections, the questioning process, clarifying predicting, determining what is important, inference, summarizing, and evaluating.

The ultimate goal in literacy is comprehension. Does the student understand what he or she is reading? Educators from the balanced literacy school of thought imply that drill and kill methods with strict guidelines and procedures are proven to work; however, more connections made through related arts offer greater opportunities for success in literacy.

A 2007 article in The Reading Teacher describes various lessons that focus on developing a stronger ability to read. One particular lesson incorporates reading and psychomotor skills into a game. This particular game requires students to move throughout a classroom while reading a story. The first advantage is that children are moving. The concept of space awareness is being developed. Children are encouraged to move at various speeds that correlate to the tempo of the text they are reading. Key stopping points are stressed by making mandatory hopping, jumping, and standing movements in relation to punctuation. An example would be to have the students leap on all commas to allow for a pause in the reading, hop on a foot for a period, and, perhaps, jump up and down for an exclamation point. Unfortunately, there is no conclusive data represented in this study to determine if there was a specific gain in literacy or physical education (Peebles, 2007, p. 579).

Ultimately, incorporating the six language arts skills into the physical education discipline is the desired end state of new visionaries such as Debra Ballinger and Theresa Deeney (2006). Listening, speaking, reading, writing, visually viewing, and visually representing are the six language arts skills that are designated by the National Council of Teachers of English (NCTE) and the International Reading Association (IRA). Ballinger suggest that “assimilating activities such as keeping fitness journals, reading the sports pages in papers and magazines, and conducting research via the Internet will enhance literacy in school age children and assist in fostering the use of technology in the physical education periods of instruction” (Ballinger & Deeney, 2006, p. 19).

To date, there is no specific research conducted on integrating literacy and body manipulation that the researcher has identified. The idea is not revolutionary or new; however, the research to collect specific data in a manner that will determine if there is an effective, direct correlation between using body manipulation to enhance literacy, is new. Research is being conducted in similar avenues, as stated previously, with the intent to extend the reach of physical education into other disciplines in the academic arena.

Data Analysis and Results

Methodology

Children entered their kindergarten year and were phased into the physical education curriculum by the end of the first week. No initial fitness testing was to be conducted. Students began the first 3 weeks focusing on space awareness. The classroom teachers were consulted concerning student literacy level. Most students knew the alphabet song and could recognize most letters visually. Two classes were selected for participation. One class served as the control group and the other as the experimental group that would receive the intervention. Appendix A presents the pre- and post-test for the students. The post-test will be completed after the lesson unit, in the same manner, on the same page.

After the students learned the basic principles of space awareness, the class was introduced to manipulating their bodies into the shapes of different letters. Many letters of the alphabet require students to use partners to form the letters. Most letters can be formed while standing, while other letters must be formed in a sitting or laying position on the ground.

The instructor asked the assembled group of kindergarteners the question, “Who knows what the letter “A” looks like?” Numerous children raised their hands in acknowledgement. The instructor then selected two students to stand up, and, with their bodies, form the letter “A.” The students stood side by side, raised their outside arm over and across their heads and joined hands. Next, the students extended their inside arms towards each other forming the letter “A.”

While the students held their body in the “A” position, the instructor asked what letter the students had formed. After praise to the students that answer correctly, the next question would be asked. “What words start with the letter “A?” Answers included “apple, arm, and astronaut.” More praise was given to the students. The instructor then asked students what the letter “A” sounds like. Children then made the “A” sound. The class is held outdoors so being loud is no problem. The students were encouraged to be loud and in unison. The investigator found this to be very delightful for the children. “The louder, the better” seemed to be the unwritten rule.

The final phase was to have the students move around in their space and look for any nouns that began with the letter “A.” This task involves a degree of psychomotor skill that allows the children to move freely, while maintaining safety, so as to not encroach upon another student's space. Students were able to find "ants" in the immediate area.

This study was conducted until the entire alphabet had been studied. The exercise lasted an average of 8 minutes, with two to three letters per class. The instructor performed this exercise as the last exercise before the cool down and the end of the period.

As the class progressed through the alphabet, diagraphs and diphthongs would be the next featured lesson, combining two letters to make a different sound, such as "CH," "TH," "SH," "OI." The same manner of instruction would be used as in the single letter spelling. This activity requires more children to be involved physically, and leaves fewer children sitting idly, watching and waiting for the end result.

After this 2-week lesson, the classes were given a post-test by their classroom teachers. The post-test is the same as the pre-test (see Appendix A). The data were collected by the teacher, with no student names, to avoid bias and to maintain the confidentiality of the subjects.

Membership

This action research team will require the following personnel for implementation of the research project:

- Investigator - to analyze data and post results.
- Two kindergarten teachers - to administer the pre- and post-test to their respective classes.
- Two kindergarten class students - subjects to participate in the study.
- Principal - promote research project.

Data Analysis

Upon completion of the post-test, the data were collected from the classroom teachers. The investigator advised the classroom teachers that only the students that had returned the signed permission slips should have their data recorded and submitted to the investigator; furthermore, the classroom teachers were to ensure that the data collection sheets were only identified by an anonymous numerical designator so that the investigator would not be able to identify the students.

The investigator first analyzed the data from the control group. Findings were that four students did have a positive gain on one of the two-letter combinations. One student made positive gains on two of the two-letter combinations. Six students showed no changes between the pre-test and post-test. One student was absent on the day of the post-test. Six students failed to return their signed permission slips, and their data were not submitted for analysis. (See Figure 1.)

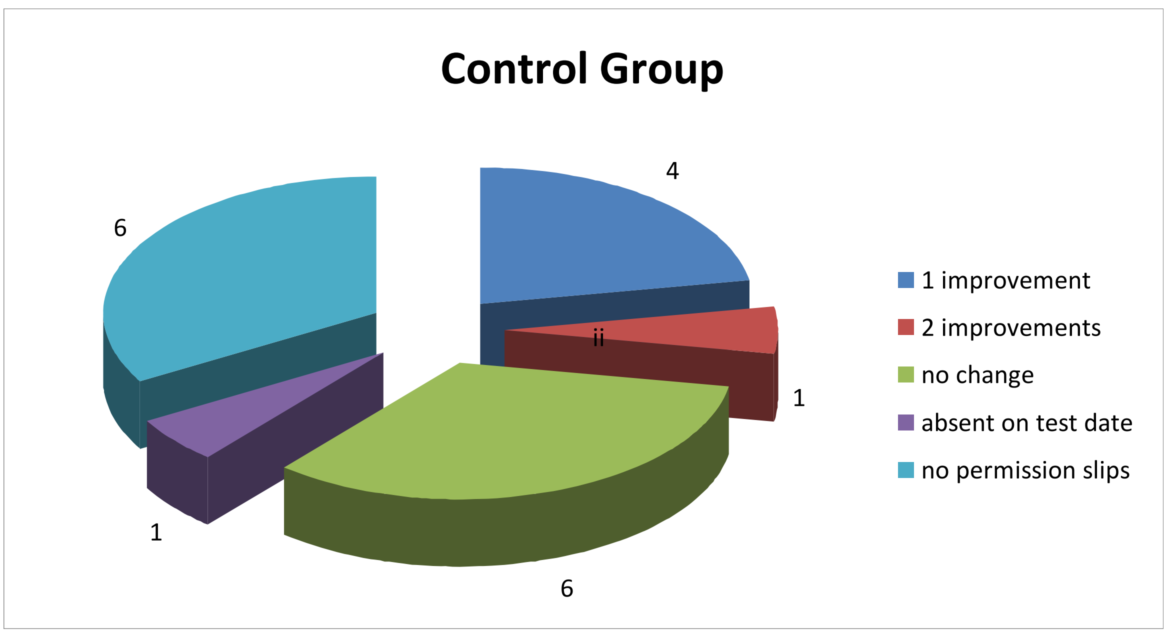


Figure 1. Control group data.

This data led the investigator to assume that, regardless of the lack of intervention, students were still learning in the classroom environment. One possibility is that the students were communicating amongst themselves outside of the physical education classroom, discussing what they did in class. Since the students are only in kindergarten, the investigator does not place a high value on this theory.

Next, the investigator analyzed the data from the group that received the intervention, which was more conclusive. The investigator found that five students showed improvement in one, two-letter combination. There were three students that showed a positive improvement in two of the two-letter combinations. There were two students that demonstrated a positive improvement in three of the two-letter combinations. Two students were absent on the day of the post-test. There were no students in the intervention group that had no change. Six students failed to return the signed permission slips; therefore, their data was not used in the analysis. (See Figure 2.)

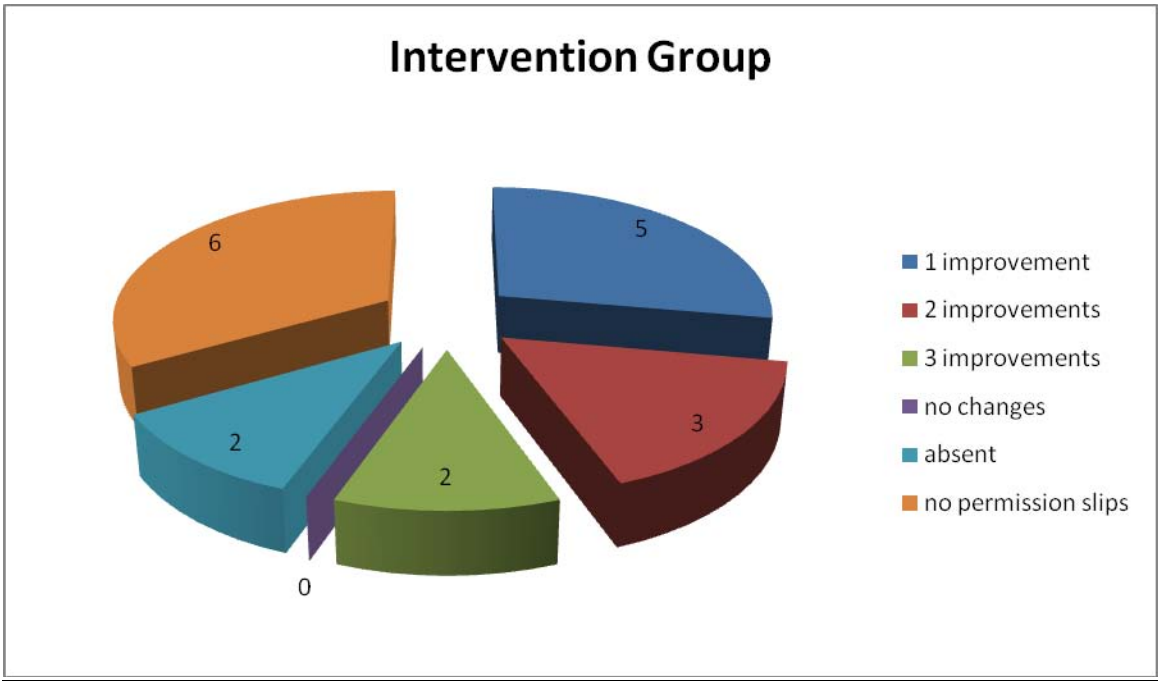


Figure 2. Intervention group data.

Conclusions and Recommendations

Conclusions

When comparing the two classrooms data, there were direct correlations between the group that had received the intervention and the group that did not receive the intervention. There were a total of 24 students that participated in the study. There were 12 students that failed to return their permission slips. There were three students absent on the day the post-test was administered. The intervention group had 10 students that demonstrated a greater knowledge and retention of diphthongs and diagraphs, visually and orally. This totaled 100 percent for those students who were present on the day the post-test was administered. Of these 10 students that had gains, 5 of them had gains in multiple areas.

The control group had five students that demonstrated a greater knowledge and retention of diphthongs and diagraphs, visually and orally. Forty-five percent of the students made a positive improvement. Of these five students that had gains, only one of the students had gains in multiple areas. There were six students that showed no improvements of any kind.

To summarize the data, 45 percent of the control group students, which had no extra reinforcement, showed a gain in retention and knowledge. In the group that received the intervention of using body manipulation to reinforce emergent literacy fundamentals, 100 percent of the students increased their retention and knowledge. This positive correlation, on a limited scale, demonstrates that using body awareness and manipulation skills assists in the knowledge gained and the retention of information. This study also further emphasizes the importance of incorporating lessons for those students that are kinesthetic learners.

Recommendations

Future studies that may be similar in nature should examine the current level of the young students with regard to their level of space awareness. Many students, at ages 5 and 6, still are not fully aware of how intermittent contact with other students can affect participation in a learning environment. The investigator noticed several occasions of accidental contact that resulted in small arguments. “He’s touching me” or “he hit me” were phrases that came to the investigator’s attention. These arguments can be corrected by more attention to developing personal space early in the school year.

The other noticeable opportunity is the students that do not speak English as their primary language. These students may show as outliers during the data analysis. These students may show more gains than other students, or they may show minimal improvement.

Another recommendation that was made to the investigator came from a classroom teacher before the pre-test was administered. The investigator created the index cards for the test in capital letters. The classroom teacher suggested that the letters on the index cards, when written in two-letter combinations, should have the first letter capitalized with the second letter as lower case. The students were used to seeing these letters in the classroom in this format. The investigator agreed, and made the necessary changes to both sets of index cards.

References

Ballinger, D. A., & Deeney, T. A. (2006). Physical educators as teachers of literacy. *Journal of Physical Education, Recreation and Dance*, *77*(5), 18-23.

Birch, J. R. (2000). Expanding literacy and integrating curricula through dance. *The Educational Forum*, *64*(3), 223-228.

Cowan, K., & Albers, P. (2006). Semiotic representations. *The Reading Teacher*, *60*(2), 124-137.

Greenberg, P. (2005). Five ways to achieve quality early childhood education. *Principal, 85*(1), 26-29.

McGonigal, K. (2007). Teaching restorative yoga: Learn the guiding principles that will help you provide a fully relaxing experience for your students. *IDEA Fitness Journal*, *4*(5), 95.

Morrow, L. M. (2004). Developmentally appropriate practice in early literacy instruction. *The Reading Teacher*, *58*(1), 88-90.

PE Central. (2007). Retrieved May 19, 2008, from http://www.pecentral.org/

Peck, H. L., Kehle, T. J., & Bray, M. A. (2005). Yoga as an intervention for children with attention problems. *School Psychology Review*, *34*(3), 415.

Peebles, J. L. (2007). Incorporating movement with fluency instruction: A motivation for struggling readers. *The Reading Teacher*, *60*(6), 578-581.

Richardson, J., Richardson, M., & Sacks, M. (2006). Families and school personnel involved in a literacy and physical activity partnership. *Reading Improvement*, *43*(3), 129-135.

Strickland, D. (2004). The role of literacy in childhood education. *The Reading Teacher*, *58*(1), 86-100.

The President's Challenge. (n.d.). Retrieved May 19, 2008, from http://www.presidentschallenge.org/

Appendix A
Data Collection Form

Student ID
#________

Pre test | | | | Post test

Letter	Visual recognition	Oral representation		Letter	Visual recognition	Oral representation
T				T		
H				H		
O				O		
I				I		
C				C		
S				S		
TH				TH		
CH				CH		
SH				SH		
OI				OI		
OU				OU		

Index cards are to be labeled with the mentioned letters on one side of the index card only.
The test proctor should inform the students to attempt to identify the letters on the index cards.
Students should attempt to visually identify the letters and then make the sounds they represent.

Drama in the Classroom

Rhea Thurman

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-099.

Introduction to the Problem

Today, the teaching profession seems to be focused on test scores and standardized success, above all else. Teachers everywhere are talking more about No Child Left Behind than the children in their classroom right now. Education seems to be locked in conflict between the push for differential instruction, state performance indicators, and measurable gains. Teachers seem focused on the ever more difficult task of preparing a diverse population to take the exact same test. What can be done to spark creativity, improve comprehension and retention for the long haul, and build classroom community? Students and teachers need a creative timeout.

Can drama find a place in the elementary classroom? Teachers struggle each day to make content relevant and keep students engaged in this high-tech world where attention spans are only as long as it takes to change a channel or click a mouse. Theatre-related activities can be useful tools for the creative classroom. Through drama activities and games, students can learn to think on their feet, practice problem solving skills, increase reading fluency, build stronger concentration muscles, and utilize visualization strategies helpful in every subject area. All this can lead to higher scores and success for all.

With the proper introduction, drama in the classroom can bring about creative change and enhance the learning environment. The purpose of this research project is to implement theatre techniques and activities into the regular routine through a language arts unit in a third-grade classroom. The goal is to measure the comprehension and retention of material as the theatre activities are introduced, and to monitor any change in the level of engagement with which students participate. A control group will be established, along with the research classroom engaged in the project.

Review of Literature

Process drama has many forms, rooted in improvisation exploration and dramatic play (Nelson & Moss, 2003). Whether you call it process drama or educational theatre, it is all about using techniques and activities associated with drama to teach and inform. Rijnbout (2003) asked, “Does process drama achieve what it sets out to do, or is this educational model based on wishful teaching?” (p. 6). This thinking also raises questions of measurability and validity that cannot be ignored. Process drama is loaded with goals, objectives, and purpose. Teachers have to do whatever they can to breathe life into the education of our students.

One of the foremost voices in education for the integration of the arts is Claudia Cornett. She has advocated for the meeting of education and the arts for many years, written curriculum, provided teacher training, and taught in the classroom, all to prove the point that drama has a place in the classroom. In her 2nd edition of *Creating Meaning through Literature and the Arts*, (Cornett, 2002) she devotes two chapters to the subject of drama in the classroom. Cornett’s book cites study after study where data shows a substantial increase in everything from reading proficiency to dramatically more positive self-image concepts. She cites studies where remedial readers passed their higher-scoring counterparts. She reports vocabulary and reading gains were made across the board. Oral and written communication improved. ESL students showed greater improvements. She makes a convincing case that this was all because drama practices were incorporated into the existing curriculum. Learning to concentrate and retain knowledge involves the comprehension of material on multiple levels. We know a child will learn something faster, and retain it longer, when it comes from more than one source. This kind of learning takes concentration. The skills needed for concentration on this level are ones that need to be taught, reinforced, and practiced. Supporting art as a "reinforcer" can be a powerful reinforcement to the need for creative thinking through the arts in the classroom.

Wolf and Wolf (1985) write rather plainly of the connections being made. They say students involved in creative education will gain knowledge not found in other classes. For example, a student studying creative writing will read more carefully for imagery, expression, and meaning, and, most certainly, develop stronger skills from the exercise.

Allen (2000) writes about the importance of building community in the classroom. He says creating an atmosphere where students feel mentally safe, accepted, supported, and committed to one another is the best environment for learning to happen. The Virginia Education Association has organized a group of educators who are leading the way to this intentional classroom community. These educators believe creativity can lead to community and cooperation. Mildrum (2000), along with Hands, co-authored a creativity curriculum, designed to be used in the classroom. They speak to how creativity improves with practice. The development of an atmosphere based on cooperation can produce an excitement for experimentation and a genuine appreciation for outstanding work. The students begin to recognize each other for their individual contributions and the impact each could make on the whole.

Students will face problems inside and outside of school for the rest of their lives. They need the skills to step back, study the problem, and take action, making the best choice for their solution. Few real-life problems and situations have only one right solution. Through theatre, we can help students to learn, understand, and make sense of their surroundings. Styslinger (2000) expounds on the extensive advantages of interweaving drama practices into the educational classroom. She has witnessed the opportunities for improved literacy, increased collaboration, and creative problem solving. There are overall advantages found by the linking of drama to the classroom. Because of drama, students understand more, have increased observation skills, and have more ideas and opinions. They can also then express these ideas more effectively.

Drama in the classroom is also a means for making connections. The areas of comprehension, concentration, community building, and creative thinking are connected. These theatre techniques can help students to make connections. For better or worse, drama is used to explore real life. Theatre can be one way to help make sense of people, events, and happenings. Theatre is being used in museum settings in the United Kingdom, as well as the U.S. The Mount Vernon Museum and Garden has used museum theatre as a kick-off event for the reinterpretation of their site. Museums have historically been places where, "Objects are cataloged, numbered, lectured about, demonstrated, touched, hung on the wall, and often placed behind glass for safe keeping and contemplation" (Schindel, 2002, p. 10) as described by the administrative director of DramaMUSE Associates. Her company creates interactive theatre productions and drama programs for museums. Through the actors, using the actual objects from the museum, history is brought to life and made real. What better place to learn about people and the events of their lives than where the events took place? Theatre has been used to teach about the past for thousands of years. Why not use theatre in today's classroom?

While teaching elementary educational drama, I experienced success with techniques that improved individual and group concentration, and provided opportunity for building community, as well as providing multiple opportunities for creative thinking. I am curious to know if these same techniques can be used with core subjects in a traditional classroom setting. Will my students experience improved comprehension, retention, and concentration? Would my class community improve through intentional, team-building strategies? Can students be taught to increase the use of their imaginations? Will intentional activities designed for creative problem solving increase their ability to resolve tough issues?

Data Collections and Results

Data Collection

Subjects

The participants of this study consisted of a third-grade classroom in a suburban area of Chattanooga, Tennessee. This classroom has 20 students (10 girls and 10 boys). About one third of the class is above grade level in reading and math. The rest are on grade level. Several students have already made one grade-level gain this school year, to be on grade level. Three students have been identified to receive special services three times per week for 1 hour. All the students in the class will participate. For the purpose of this study, there will be a research class and a control class.

Methodology

The major goal of this research project is to measure any differences the theatre activities might make in the comprehension and retention of the material from a language arts curriculum unit. Another goal is to determine if these types of activities can be incorporated into the regular learning routine. The research class will engage in the theatre activities throughout a 2-week language arts unit. The control group will study the same language arts unit, without the benefit of any theatre activities. During the 2-week unit, the research class will use the same leveled readers and other curriculum materials as the control class. The only difference will be the addition of "theatre timeouts," which will be incorporated into the language arts block. The theatre timeout activities will include the use of several "props" to be used throughout the unit, including some additional reading materials. Students in both classes took the same pre-test to gauge prior knowledge of instructional material to be covered in the upcoming language arts unit. The same test was given after the 2-week unit had been taught. The research class also completed a survey about the theatre activities.

One goal of the project was to determine if theatre activities could be incorporated into the regular classroom routine. The weekly schedule of the research class made theatre activities possible three times the first week and two times the second week. The first session was an introduction to the games and activities. Although the class did engage in activities, the first session was designed to set the stage for participation and expectations. Because the students were familiar and comfortable with the researcher in the role of teacher, the class was more willing to accept and participate in the activities. The introductory session went smoothly, and the class was willing and open to participation.

Recruitment and Selection Plan

The control class was selected at random from the other third grade classes. The researcher explained to the class they would take a survey to gauge prior knowledge of the upcoming unit. They were acquainted with the researcher as a student teacher from the adjacent class, and participated willingly, eager to “help with the researcher’s homework.” After the first day of theatre activities, this was a major topic at recess; the control group assumed they, too, would be receiving the same activities. They were openly resentful when it came time for the post-test, and they had not gotten to play any of the games the other class had played. Many asked why they did not get to play the games. Several students from the other classes began asking at recess if they could come over and play the games.

Instructional Plan and Leadership

Theatre activities were planned into the language arts curriculum for this 2-week unit of study. These activities included small-group and whole-group instructional activities. Included were reader's theatre, vocabulary word recognition and visualization activities, and association games centered on vocabulary and verb usage. Whole-group activities were also focused on concentration and cooperation. Several props were incorporated into the small-group, guided reading to spark usage of different reading strategies. Readers were encouraged to make use of any and all reminders to aid in reading comprehension. Reading strategies were integral to the concentration games, and props were used to guide students in strategy usage.

Results

The students loved it! Each day started with, "Is today a theatre day?" For some of the whole-group activities, desks were pushed aside and students were asked to step outside their comfort zone. For other activities, students created their own beginning, middle, or end to a familiar story, or read in a theatre style. The students were engaged, energetic, and excited to learn what happens next. After the second session, students began to ask for repeats of favorite activities. It merely had to be mentioned that today might be a theatre day, and the mood changed. Students perked up and returned to task. Were they learning differently, learning more thoroughly, or retaining information longer? Or had they simply been given a new motivator?

The pre- and post-testing information indicated 8 of the 20 students increased in scores by 50% or less. Twelve increased scores dramatically, some with 100 percent increases (see Figure 1).

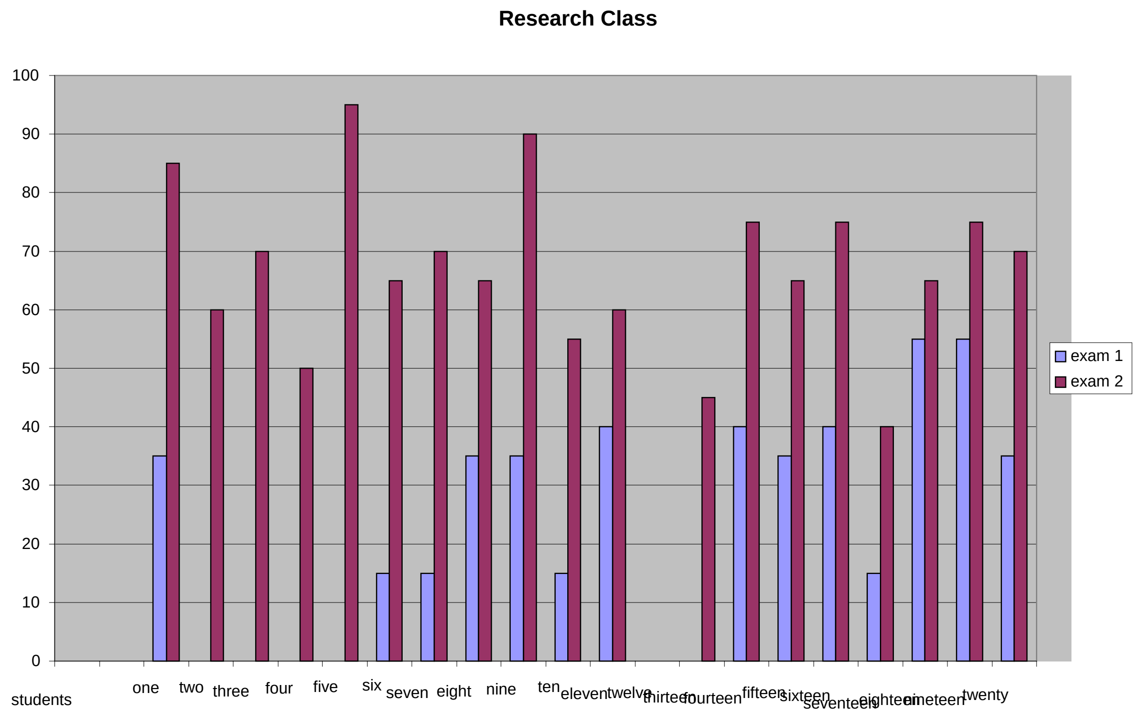


Figure 1. Pre- and post-test results.

These dramatic scores may reflect that the inclusion of theatre activities made the difference. With the comparison of the control group, these dramatic scores may merely show that the material covered in this unit was new, and little prior knowledge existed. The researcher's observations, and student participation, say theatre games were enjoyed by an overwhelming number of students, and those who were not allowed to participate were openly resentful. In hindsight, the test itself may have been flawed. It was confusing to many students. The format was difficult to understand, and unfamiliar vocabulary was used. There may also have been an attempt to measure too much information (see Figure 2).

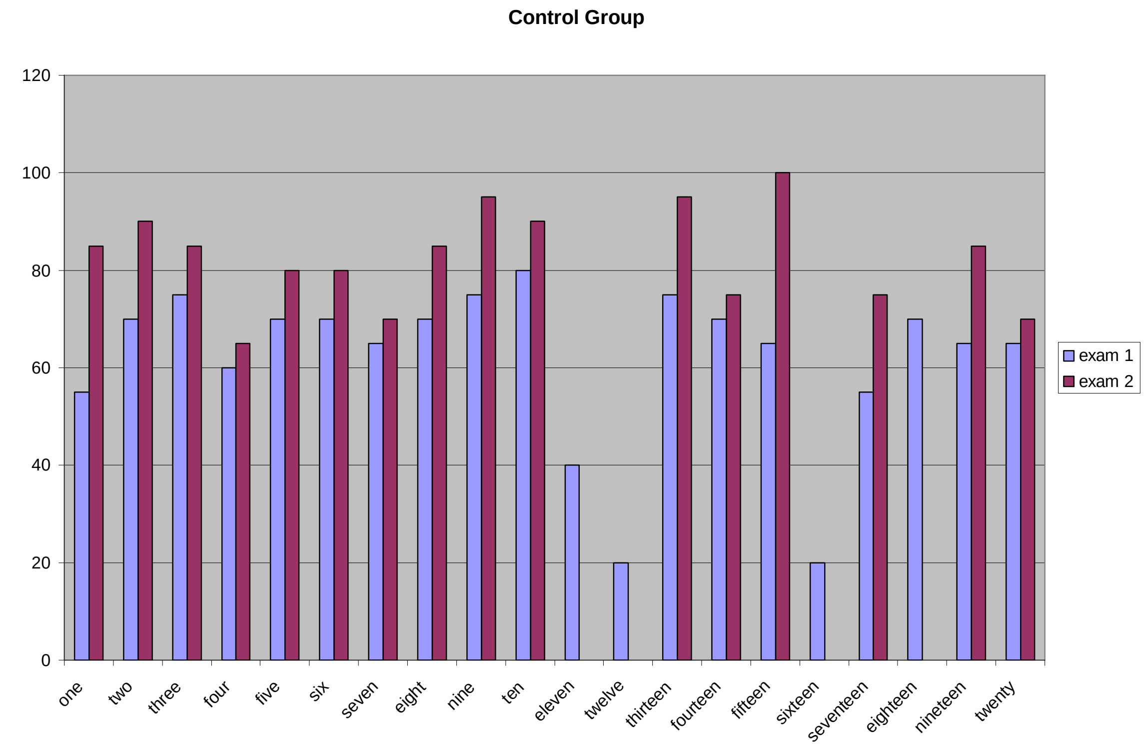


Figure 2. Pre- and post-test results.

The research class students also completed a survey related to their perceptions of the effectiveness of the activities. The survey asked five questions related to retention, class community, concentration, visualization, and overall feelings about the activities. I found these results most interesting. More than 50% of the class said the activities helped them to remember information. Seventy percent of students said the theatre activities helped with visualization while reading. An overwhelming majority, 80% of the class, said the activities helped the class to get along better and be more tolerant. Ninety-five percent said the concentration techniques were helpful, 30% of that number said they believed, if they continued with the activities, concentration might improve even more. The survey listed several descriptive words for students to choose in describing the theatre activities. Fun and exciting were the big word winners, with 75% and 70%, respectively. Education could do a lot worse than fun and exciting. The students were also encouraged to list the activities they liked the most. This list showed no overwhelming winners. Everyone seemed to have their own favorite for very different reasons.

Conclusions and Recommendations

Conclusions

This brief experiment of incorporating theatre into the classroom fell into line with the supported research. This education experience seemed to be in sync with research from the experts, as well as the students. Students were excited and engaged in a different manner. From this research, it would be safe to say drama can be incorporated into the classroom. Time and energy should be given to something that excites and engages students.

The cooperating teacher was intrigued and interested in the activities and games introduced to her students. She asked, over and over again, for copies of materials and directions for specific activities. Several other teachers, particularly the control group teacher, made inquiry about the activities, and how they might be incorporated. These techniques and activities can be learned and shared with any teacher who is willing to give theatre a try. These techniques can be learned through workshop settings, and implemented as much or as little as the teacher wants to incorporate them into the classroom routine.

Recommendations

These activities can be incorporated into the traditional classroom setting, if the teacher is willing to move the desk aside and step outside the box. The teaching team involved with this research was very supportive of this project, but were reluctant to believe a long-term commitment could be made. Their thoughts were that set up and preparation might take too much valuable instruction time. This research project proved to these teachers that, with minimal additional planning, these engaging activities could be a helpful part of the curriculum. The researcher showed these types of activities could transition smoothly into the instructional day. After seeing the activities in action, several teachers expressed interest in the incorporation of some of these activities into the regular routine. The students were interested in the activities happening across the hall, and wanted to be a part. They forced their teachers to find out more.

The local Allied Arts agency would be the perfect partner for additional training and professional development. Area schools are encouraged each year to submit grant proposals for arts in the classroom projects. Allied Arts will provide all the necessary professional development and support needed for training in, and implementation of, these types of theatre activities. The researcher agreed to obtain the appropriate forms, and provide assistance or to gather additional information, for the proposal.

Technology would be the perfect venue to share this type of artistic endeavor. Students could video tape themselves over a period of time. The changes and growth would be evident. Even in the short period of 2 weeks, the students' reading fluency and comfort speaking in front of the class improved greatly. Long-term progress would be even more dramatic. If the students created a video diary of classroom work, they could assess for themselves their improvements. Technology also provides opportunity for sharing work with students across town, the state, or the country. Other classrooms engaged in similar activities could become partners in projects, or, merely, another audience for the purpose of sharing work. Performance is not the focus of this type of activity, but having the opportunity to present something one has created can provide its own educational value.

References

Allen, T. (2000). Creating community in your classroom. *Virginia Journal of Education, 93,* 6-10.

Cornett, C. E. (2002). *Creating meaning through literature and the arts*, (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Mildrum, N. K. (2000). Creativity reigns (not reined) in the regular classroom. *The Education Digest,* 33-38.

Nelson, G. D., & Moss, E. (2003). Harnessing the winds. *Stage of the Art, 15*(3), 4-5.

Rijnbout, F. (2003). The unbearable liteness of process drama. *Stage of the Art, 15*(3), 6-11.

Schindel, D. N. (2002). Museum theatre: Telling stories through objects. *Stage of the Art, 14*(4), 10-17.

Styslinger, M. E. (2000). Relations of power and drama in education: The teacher and Foucault. *Journal of Educational Thought, 34*(2), 183-199.

Wolf, T., & Wolf, D. P. (1985). The arts as reinforcers of basic academic skills. *The Education Digest,* 44-45.

Appendix A

Pre/Post-Test

1. What does it mean to compare and contrast two or more items?
Compare=_______________ Contrast=_______________
(the way things are ______) (the way things are ______)

Choose the correct word and circle the correct answer:

2. A dock where ships are loaded and unloaded.
a. quick b. quay
b. ashore d. quail

3. Rested in pleasant warmth.
a. berth b. stranded
c. basked d. borrow

4. To work together with another person toward a successful outcome.
a. imagination b. preparation
c. rendition d. cooperation

5. A successful reader can identify each of these parts to a story.
Who: ____
What: ____
When:____
Where: _______________________________________
Why: ____

6. Give an example of a helping verb. ____________
Use it in a sentence.

---

7. Give an example of an irregular verb_____________
Use it in a sentence.

---

8. What can successful readers do to help comprehension when reading?
a. ask the teacher b. re-read a section or the story
c. make you best guess d. check with a friend

9. Choose the correct word ending: (Circle the correct spelling)

<u>party</u>	<u>stop</u>	<u>carry</u>	<u>fix</u>
partys	stoped	carrid	fixxing
parties	stoppd	carryed	fiksing
partes	stopd	carried	fixing
partyes	stopped	carryd	fixng

10. What strategy does a successful reader use **<u>after</u>** reading to remember a story?

a. monitor | b. summarizing
b. clarify | c. predicting

Appendix B

Sample Student Survey Questions

1. Did the theatre games help you with remembering information?

Yes A little No

2. Do you think the theatre games helped us to get along better as a class?

Yes A little No

3. Did the theatre warm-up help you to concentrate and focus on doing your best?

Yes A little No

4. Did the theatre games help you with visualization, (the movie playing in your head while you read)?

Yes A little No

5. Did you think the theatre games were: (circle the describing words)
boring fun tough silly exciting a waste helpful good idea

Peer Education

Elke Waffel

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-097.

Introduction to the Problem

Today, we are living in an age of massively decreasing attention spans, due to many different factors. It can be blamed on television shows in which all of life's problems are solved within half an hour, and commercials that bombard children with as many images and descriptions, as possible, in their allotted time of 30 seconds. Some people blame children's unsatisfactory attention spans on video games that change scenes and go to any lengths to keep a child interested. There is also the popular trend of diagnosing a child for Attention Deficit Disorder (ADD) for merely behaving as a typical child is expected. There are many more theories regarding what is wrong with America's younger generations, and one could argue for days on the subject. Whatever the reasons for the decreasing attention spans of today's youth, it is a problem that is affecting several different aspects of society, with one of the most obvious being the school system.

A successful teacher is one who is always thinking of new ways to instruct and keep the interest of her students. Now, however, teachers are under more pressure than ever before to not only devise new ways to educate their students, but they also find themselves responsible for entertaining students in some way, and, therefore, keep their waning attention. One particularly difficult subject is history. Students tend to think that if some event did not occur in their lifetime, and does not affect them directly, then it is not important enough for them to study in school.

One interesting alternative to a conventionally-taught high school history class is peer education, a classroom instructional method in which the students are responsible for teaching and learning the lessons. Each student would be responsible for teaching one chapter or section of the textbook to the rest of the class. Ideally, this would take place throughout the school year, and each student would be responsible for about a week's worth of material. The students would have to follow guidelines set by the teacher, and all students would be tested every couple of weeks to monitor how well they are doing using this new teaching method. However, for the purposes of this study, it will be based on a 2- to 3-week period during which each student, or pair of students, would present one lesson. The teacher would take a minor role in class discussions and be available to help the students prepare and gather information. The results would be compared with those found in a conventional class, taught by the same teacher and used as a control group.

The purpose of this study is to discover whether or not students in a high school history class perform better and are more engaged in class discussions under a traditional, professional instructor, or when they are given the responsibility of teaching each other, as in peer education.

Many different variables could affect this study. Both classes being monitored, the peer education class and the conventional class, must be equally heterogeneous. For example, one cannot be an advanced class while the other is an average class. There must be a broad range of students in each classroom. Also, each class must be taught by the same teacher. Individual student motivation is also a major variable. This variable is frustrating because it is not something over which the teacher and researcher have much control.

There are several research questions that will be addressed during this study. They are as follows:

- Do the students retain more information under this instructional method, as opposed to a conventional method?
- Are the students more engaged with the material and in class discussions when the class is directed by one of their peers?

- How is the students' overall satisfaction level with the class affected under this instructional method?
- How are the student's grades affected when they are instructed by their peers?

Review of Literature

There is a glaring lack of research done on this subject. There are three themes in the literature relating to this topic. The first is the effect of peer teaching in a college classroom environment. The second is peer tutoring, the vast majority of which took place in elementary classrooms. The third is the roles that students have on their peers while learning and developing language and reading skills.

The theme of peer teaching is one that is most closely related to the premise of this study. In 1995, Donna E. Alvermann published her study of an eighth-grade, language arts class. This class was based on peer-led discussion groups instead of a conventional teacher-led lecture. Alvermann observed and analyzed three students from this class. This study led Alvermann to several conclusions. The first was that, while the idea of peer-led discussions is a good one, the teacher must be careful to make sure that one gender does not dominate the discussions. At the same time, if a student is adamant about not speaking in front of the entire class, the teacher should not pressure them to do so.

Lois Rubin and Catherine Hebert published an article about peer teaching in 1998. This study took place in three college courses: freshman composition, American studies, and international diversity. In each class, groups of four or five students would teach the class for 1 day, at some point during the semester, while the professors observed. Rubin and Hebert (1998) had high praise for the results of their study. They said that:

> …the whole process…was constructive for students, both in their roles as teachers and as audience…teachers gained two kinds of awareness, social and intellectual…students became conscious of the own intellectual and interpersonal skills. (p. 29)

The most recent study on peer teaching was also performed in a college classroom, by Catherine Crouch and Eric Mazur (2001). It took place in two Harvard physics courses, one algebra-based and one calculus-based, and both for non majors. At the beginning of each class, the students were required to answer a conceptual question about the readings they were to have done the night before. They then had to explain their answers, and how they arrived at them, to their fellow students. There were also conceptual tests given at the beginning and end of each semester. The end result of this study was that the students' overall understanding and mastery "improved dramatically, and their performance on traditional quantitative problems improved as well" (p. 975).

The second theme related to this proposed study is peer tutoring. The literature would have been more useful if there were more studies conducted in middle schools and high schools. As it was, each of these studies was conducted in an elementary school classroom. The study by Debra Kamps, Patricia Barbetta, Betsy Leonard, and Joseph Delquadri (1994) involved how peer tutoring could help children with autism in an inclusion classroom. There were three autistic boys: one in first grade, one in second grade, and one in third grade. The results showed that the reading rates and number of correct words was greatly improved for each boy. Also, their social skills improved as a result of more interactions with their peers during the peer tutoring sessions. The last result was that the typical children also improved because they were able to understand things better when they could explain them to others.

The other two studies on peer tutoring were both published in 1999. Carol Beaumont (1999) studied how peer tutoring helped children in a second-grade, bilingual, inclusion classroom. Beaumont discovered that peer tutoring, in this case, was much more complex than in other studies. Not only were there language barriers, but there were also social barriers between the typical children and the special education children. She states that, for this classroom method to work effectively, the teacher must be actively involved and monitor the students constantly. The study by Mortweet, Utley, Walker, Dawson, Delquadri, Reddy, Greenwood, Hamilton, and Ledford (1999) also looked at how peer tutoring affected inclusion classrooms. This study took place in two inclusive elementary school classes. The results showed that, by the end of the study, almost all of the special education students had improved both academically and socially. The results were very similar for the typical students, as well.

The third, and least helpful, theme relating to the present study was how peer tutoring and peer assistance aided children in languages and reading. One of the first studies was by Julie Wollman-Bonilla and Barbara Werchadlo (1999). This focused on how a child's peer can help with reading comprehension and expressing themselves in writing. This study was done in a first-grade classroom. The results examined the impact of the teacher, the teacher's instructions, and peer sharing. They found that peer sharing, by far, had the greatest impact on the students. They enjoyed hearing each other's ideas and talking about them.

Elizabeth Knutson (2001) focused on how student-student interaction in a college French class helped the students obtain a better understanding and mastery of a second language. The results were immensely in favor of student-student interaction. Knutson found that this helped the students much more than talking to or listening to the professor.

Mathes, Torqeson, Clancy-Menchetti, Santi, Nicholas, Robinson, and Grek (2003) studied how peer assistance helped struggling, first-grade readers. The results consistently showed that children who were having trouble reading improved much more when aided by one of their peers, as opposed to being helped by a teacher.

There was one study which did not fit into any of these three themes. Cooper (2002) merely focused on what a teacher should do, and how she should organize and structure her classroom, to better enable peer learning.

On the whole, the existing literature, or rather the lack thereof, makes a strong case for the study being proposed.

Data Collection and Results

Data Collection

Prior to teaching the unit on Medieval Europe to two classes of high school World History students, a pre-test was given. It was made clear to the students that this pre-test was only for data collection in this study; it would not go in the grade book, and, therefore, would neither count for nor against them in any way. This pre-test consisted of 25 multiple-choice questions covering key terms, events, and individuals of this era (see Appendix A). Group work and forms of peer education were incorporated into this unit anyway, so, for the purposes of this study, and because of time constraints, the unit was modified slightly for each class. I chose 2nd block as the test group because it was a larger class (20 students compared to 4th block's 11 students). However, only seven students from 2nd block and five students from 4th block chose to participate in the study.

The students of 2nd block were assigned a project on the Black Death. The students were divided into five groups of four students each. Each group was assigned a different aspect of the

Black Death: economic disruption, the Flagellants, peasant uprisings and persecutions, different forms of the plague, and medicine in the Middle Ages. Each group was given all of the materials they would need, and were responsible for researching their assigned topic using those resources. The projects were assigned on a Monday and the presentations were due on the next Monday. In that week, the students were given ½ to 1 hour of class time each day to work on the research or to prepare their presentation. I supervised the research and helped the students to narrow down some of the information, if they were having trouble. Each group was required to present their topic while the rest of the class took notes on it. The students were given very basic guidelines for their presentations because I wanted them to use this as an opportunity to show off their creativity. All of the groups chose to present their topics in a skit format, all of which were very successful and entertaining. In this way, the students used peer education to teach themselves and their classmates about the different aspects of the Black Death. For 4th block, I taught the entire unit, including all of the aspects of the Black Death.

After instruction on this unit, a post-test was given. This test was the unit test, and, therefore, counted as a grade. This post-test also consisted of 25 multiple choice questions, along with eight short answer questions, of which the students chose five (see Appendix B).

Results

The hypothesis of this study was that 2nd block, the test group, would have greater improvement than 4th block, the control group. This was expected because, according to all previous research, students learn more and retain information better when they learn from each other and are responsible for teaching each other. In practice, this theory was proven to be valid, though I do not believe that these results are totally reliable. Only 7 of the 20 students in 2nd

block returned their consent forms, and only 5 out of the 11 students in 4th block returned their consent forms. Therefore, only a fraction of the students were able to contribute to this study.

In 2nd block, 100% of the students showed improvement, and the average rate of improvement was 38%. In 4th block, 80% of the students showed improvement, and the average rate of improvement was also 38% (see Figures 1 and 2).

Class	Pre-Test Average	Post-Test Average	Average Improvement	Percentage of Students Showing Improvement	Percentage of Students Showing Decline
2nd Block	35	73	38	100	0
4th Block	24	44	38	80	20

Figure 1. Class averages for pre- and post-test data.

As both the table and the graph show, 2nd block began with higher scores on the pre-test, and continued to stay above 4th block throughout the unit. The average percent of improvement for both classes was 38. The highest rate of improvement was 96%, and this student was in 2nd block. Only one student's grade actually declined, and this was in 4th block.

Figure 2. Class averages of pre- and post-test data.

Conclusions and Recommendations

Conclusions

The results of this study support the original hypothesis that students learn more and retain knowledge better when they are learning from each other and when they have been given the responsibility of teaching their fellow students. The students from both classes had little prior knowledge of the material, and, therefore, did not do well on the pre-test. Though both classes showed a marked improvement from pre-test scores to post-test scores, 2nd block students, the test group, all showed improvement, compared to 80% of the control group students, 4th block, showing improvement.

Recommendations

While this study and previous research all indicate that peer education has many benefits, and students learn more and retain information better through this, it is not realistic to solely rely on this method. There are other factors in the classroom which need to be taken into account. The most important of these is individual student motivation. This is important to every classroom, but especially when using this method. If the students do not understand why they need to learn history, and if they are not motivated, they will not learn from the other students and they will not be able to educate their peers on their assigned topic. In this way, they not only do themselves a disservice, but they also affect the learning of the entire class. There needs to be a compromise in the classroom between teacher-led education and student-led education. A mixture of both would most likely have the best results.

Professional development is an important resource for all teachers. In this case, taking courses and seminars in constructing project-based pedagogy would be very helpful. In this way, the instruction would not be purely teacher-led, and many projects could be adapted to use for peer education. The National Council for the Social Studies (NCSS) offers professional development seminars in this and similar areas. Professional development in how to constantly and consistently motivate and encourage students would also go far in making this method of education more successful.

There is not any grant money available for this particular topic. However, the NCSS has the Fund for the Advancement of Social Studies Education grant, which supports research and projects geared toward the improvement of social studies education. This could be used to do further research on this subject.

The use of technology in this area, is really only limited to the imaginations and resourcefulness of the students. The Internet could be used as a valuable research tool.

PowerPoint could be used as a means of presentation. There are many different computer programs that would be useful, if they were available.

References

Alvermann, D. E. (1995). Peer-led discussions: Whose interests are served? *Journal of Adolescent and Adult Literacy, 39*, 282-289.

Beaumont, C. J. (1999) Dilemmas of peer assistance in a bilingual full inclusion classroom. *Elementary School Journal, 99*, 233-253.

Cooper, S. M. A. (2002). Classroom choices for enabling peer learning. *Theory into Practice, 41*, 53-57.

Crouch, C. H., & Mazur, E. (2001). Peer instruction: Ten years of experience and results. *American Journal of Physics, 69*, 970-977.

Kamps, D. M., Barbetta, P. M, Leonard, B. R, & Delquadri, J. (1994). Classwide peer tutoring: An interesting strategy to improve reading skills and promote peer interactions among students with autism and general education peers. *Journal of Applied Behavior Analysis, 27,* 49-60.

Knutson, E. M. (2001). Fostering student-student interaction in a whole group setting. *French Review, 74*, 1138-1151.

Mathes, P. G., Torgesen, J. K, Clancy-Menchetti, J., Santi, K., Nicholas, K., Robinson, C., & Grek, M. (2003). A comparison of teacher-directed versus peer-assisted instruction to struggling first-grade readers. *Elementary School Journal, 103*, 461-479.

Mortweet, S. L., Utley, C. A., Walker, D., Dawson, H. L., Delquadri, J. C., Reddy, S. S., Greenwood, C. R., Hamilton, S., & Ledford, D. (1999). Classwide peer tutoring: Teaching students with mild mental retardation in inclusive classrooms. *Exceptional Children, 65,* 524-534.

Rubin, L., & Herbert, C. (1998). Model for active learning: Collaborative peer teaching. *College Teaching, 46*, 26-30.

Wollman-Bonilla, J. E., & Werchadlo, B. (1999). Teacher and peer roles in scaffolding first graders' responses to literature. *Reading Teacher*, *52,* 598-607.

Appendix A

Pre-Test

1. The fall of what empire marks the beginning of the Middle Ages?
   a. Byzantine
   b. Roman
   c. Frankish
   d. Viking

2. Who was crowned the first Holy Roman Emperor on Christmas Day, AD 800?
   a. Clovis
   b. Charlemagne
   c. Pepin
   d. Caesar

3. Where were the Vikings from?
   a. Northern Africa
   b. Northern Asia
   c. Northern Europe
   d. Northern America

4. The Vikings were all of the following **EXCEPT**:
   a. Explorers
   b. Traders
   c. Warriors
   d. Monks

5. A village attacked by Vikings would most likely be near what?
   a. A Mountain
   b. Flat Land
   c. Woods
   d. A River

6. The Medieval system of government was known as what?
   a. Feudalism
   b. Christianity
   c. Chivalry
   d. Manorialism

7. At what age would a boy begin his training as a knight?
   a. Three
   b. Fifteen
   c. Seven
   d. Twenty-one

8. What is the code by which knights lived?
   a. Feudalism
   b. Chivalry
   c. Manorialism
   d. Christianity

9. To excommunicate someone means to do what to them?
   a. Prevent them from receiving sacraments
   b. Declare war on them
   c. Kill them for a crime they had committed
   d. Bury them in a plague pit

10. What language were masses given in?
    a. English
    b. German
    c. French
    d. Latin

11. The Magna Carta was important for all of the following reasons **EXCEPT**:
    a. It restricted the power of the king
    b. It led to our modern system of government
    c. It stated basic rights of the people
    d. It said that the nobles could do whatever they wanted

12. What city was the First Crusade trying to reclaim?
    a. Rome
    b. Alexandria
    c. Constantinople
    d. Jerusalem
13. What religious group was **NOT** targeted by the Crusaders?
    a. Jews
    b. Catholics
    c. Muslims
    d. Orthodox Christians

14. The First Crusade was an attempt to remove which group from the Holy Land?
    a. Mongolian Pagans
    b. Roman Catholics
    c. Orthodox Greeks
    d. Muslim Turks

15. Which of the following was **NOT** part of the agricultural revolution?
    a. Widespread trade
    b. Using horses instead of oxen
    c. New type of plow
    d. The three-field system

16. Where did the Black Death originally come from?
    a. Europe
    b. Asia
    c. America
    d. Africa

17. What would the Flagellants most likely be holding while walking through town?
    a. Medicine
    b. Wine
    c. Swords
    d. Whips

18. About what percent of Europe's population was killed during the Black Death?
    a. 1/10
    b. 1/3
    c. ½
    d. ¼

19. How is the Bubonic Plague spread?
    a. Rat bites
    b. Dog bites
    c. Flea bites
    d. Human bites

20. Which of the following is **NOT** a result of the Black Death?
    a. The rise of the middle class
    b. The growth of towns
    c. An increase in peasants' wages
    d. The Crusades

21. All of the following could be studied at a Medieval university **EXCEPT**:
    a. Medicine
    b. Law
    c. Theology
    d. Education

22. Which of the following is **NOT** a piece of literature from the Middle Ages?
    a. Beowulf
    b. The Canterbury Tales
    c. The Iliad
    d. The Divine Comedy

23. Who could be considered the most influential woman of the Middle Ages?
    a. Eleanor of Aquitaine
    b. Cleopatra of Egypt
    c. Helen of Troy
    d. Theodosia of Constantinople

24. What medieval weapon was often used to knock down castle walls?
    a. Cannon
    b. Reflex Bow
    c. Trebuchet
    d. Moat

25. Choose the best answer:
    a. Castles were very nice places to live in
    b. Castles were built so the lord had a comfortable home
    c. Castles were crowded, smelly, and dirty

d. Castles were only used to hold prisoners

Appendix B

Post-Test

1. The fall of what empire marks the beginning of the Middle Ages?
    a. Byzantine
    b. Roman
    c. Frankish
    d. Viking

2. Who was crowned the first Holy Roman Emperor on Christmas Day, AD 800?
    a. Clovis
    b. Charlemagne
    c. Pepin
    d. Caesar

3. Where were the Vikings from?
    a. Northern Africa
    b. Northern Asia
    c. Northern Europe
    d. Northern America

4. The Vikings were all of the following **EXCEPT**:
    a. Explorers
    b. Traders
    c. Warriors
    d. Monks

5. A village attacked by Vikings would most likely be near what?
    a. A Mountain
    b. Flat Land
    c. Woods
    d. A River

6. The Medieval system of government was known as what?
    a. Feudalism
    b. Christianity
    c. Chivalry
    d. Manorialism

7. At what age would a boy begin his training as a knight?
    a. Three
    b. Fifteen
    c. Seven
    d. Twenty-one

8. What is the code by which knights lived?
    a. Feudalism
    b. Chivalry
    c. Manorialism
    d. Christianity

9. To excommunicate someone means to do what to them?
    a. Prevent them from receiving sacraments
    b. Declare war on them
    c. Kill them for a crime they had committed
    d. Bury them in a plague pit

10. What language were masses given in?
    a. English
    b. German
    c. French
    d. Latin

11. The Magna Carta was important for all of the following reasons **EXCEPT**:
    a. It restricted the power of the king
    b. It led to our modern system of government
    c. It stated basic rights of the people
    d. It said that the nobles could do whatever they wanted

12. What city was the First Crusade trying to reclaim?
    a. Rome
    b. Alexandria
    c. Constantinople
    d. Jerusalem
13. What religious group was **NOT** targeted by the Crusaders?
    a. Jews
    b. Catholics
    c. Muslims
    d. Orthodox Christians

14. The First Crusade was an attempt to remove which group from the Holy Land?
    a. Mongolian Pagans
    b. Roman Catholics
    c. Orthodox Greeks
    d. Muslim Turks

15. Which of the following was **NOT** part of the agricultural revolution?
    a. Widespread trade
    b. Using horses instead of oxen
    c. New type of plow
    d. The three-field system

16. Where did the Black Death originally come from?
    a. Europe
    b. Asia
    c. America
    d. Africa

17. What would the Flagellants most likely be holding while walking through town?
    a. Medicine
    b. Wine
    c. Swords
    d. Whips

18. About what percent of Europe's population was killed during the Black Death?
    a. 1/10
    b. 1/3
    c. ½
    d. ¼

19. How is the Bubonic Plague spread?
    a. Rat bites
    b. Dog bites
    c. Flea bites
    d. Human bites

20. Which of the following is **NOT** a result of the Black Death?
    a. The rise of the middle class
    b. The growth of towns
    c. An increase in peasants' wages
    d. The Crusades

21. All of the following could be studied at a Medieval university **EXCEPT**:
    a. Medicine
    b. Law
    c. Theology
    d. Education

22. Which of the following is **NOT** a piece of literature from the Middle Ages?
    a. Beowulf
    b. The Canterbury Tales
    c. The Iliad
    d. The Divine Comedy

23. Who could be considered the most influential woman of the Middle Ages?
    a. Eleanor of Aquitaine
    b. Cleopatra of Egypt
    c. Helen of Troy
    d. Theodosia of Constantinople

24. What medieval weapon was often used to knock down castle walls?
    a. Cannon
    b. Reflex Bow
    c. Trebuchet
    d. Moat

25. Choose the best answer:
    a. Castles were very nice places to live in
    b. Castles were built so the lord had a comfortable home
    c. Castles were crowded, smelly, and dirty

d. Castles were only used to hold prisoners

Short Answer Questions – Choose 5

1. What battle did Charles “The Hammer” Martel win, who did he defeat at this battle, and why was it important?
2. The Vikings are known as fierce warriors, but they did other things besides fight. Briefly describe some of the Vikings other accomplishments.
3. What is feudalism? How was Medieval society structured because of feudalism?
4. Describe the three stages a young man would have to go through in his quest for knighthood.
5. What does it mean to excommunicate somebody and how did the Church use excommunication during the Middle Ages?
6. Describe the three major results of the Crusades.
7. How did the Black Death get to Europe?
8. How did the Black Death pave the way for both the Reformation and Renaissance?

A Survey of Technology and Mass Media Resources in Middle Grades Social Studies Classrooms

Amanda Waller

Education 590, Spring 2008

The University of Tennessee at Chattanooga

The Institutional Review Board of The University of Tennessee at Chattanooga (FWA00004149) has approved this research project #08-098.

Introduction to the Problem

American high school students are failing history. In 2001, the National Assessment of Educational Progress (NAEP) found that 57 percent of 12th graders had below basic skills in the subject of American history, 32 percent had basic skills, and only 11 percent of those surveyed demonstrated proficient knowledge (National Center for Education Statistics, 2001).

Martin (2006) cites Loewen when he writes:

> Students Hate History [emphasis in original]. When they list their favorite subject, history invariably comes in last. Students consider history "the most irrelevant" of the twenty-one subjects commonly taught. (p. 1)

Yet formal and informal research has shown that it is not necessarily the subject of history, but the way in which history is taught, combined with inadequate source material, that poses such a problem for students (Schick, 1991; Fleming, 2002; Craig, 2002).

Teachers have long been aware that students need more than just a textbook and a lecture to fully understand history (Eamon, 2006). Fortunately, Internet-based and popular culture resources offer educators access to a wide variety of primary and secondary sources, while computer programs such as PowerPoint provide a new method of presentation. The purpose of this study is to determine if teachers believe that the use of technology and mass media resources in the classroom have any impact on students' interest and abilities in the subject of history, which resources teachers currently use in their classrooms, and which methods of instruction and resources students prefer.

Review of Literature

Research shows that many educators recognize the value of using a variety of sources in the history classroom (Coohill, 2006; DenBeste, 2003; D'Sa, 2005; Eamon, 2006; Matz &

Pingatore, 2005). Even in the 19th Century, history teachers were aware of the shortcomings of using only secondary source material to teach their students. These educators wanted to move beyond the simple memorization of facts, and help students develop a greater connection with the past through the use of additional resources. Primary sources are of particular interest to history teachers, and many researchers agree that their inclusion enhances the learning experience for students (Eamon, 2006; DenBeste, 2003; Lee, 2002). Singleton and Giese (1999) write that, when original documents and images are used:

> [S]tudents are more likely to engage in asking questions, thinking critically, making reasoned inferences, and developing reasoned explanations and interpretations of events and issues in the past and present. (p. 149)

Unfortunately, the fragility and limited availability of original historical documents and artifacts, or even quality replicas, has, until recently, made their use by students a near impossibility (Eamon, 2006).

Advances in technology, particularly the mass availability of the personal computer and the development of the Internet, have made it possible for students and teachers to access a wealth of information that was unavailable only decades ago (DenBeste, 2003; Lee, 2002). Such innovations have also changed the way in which source material is presented to students. The bulky and, often, complicated overhead and slide projector have given way to electronic presentation methods such as PowerPoint (Coohill, 2006). At the same time, teachers are increasingly recognizing the potential benefits of using nontraditional sources such as popular music, and feature and documentary films (D'Sa, 2005; Marcus, 2005; Walker, 2006; Binkiewicz, 2006; White & McCormack, 2006; Dzuris, 2003; Matz & Pingatore, 2005). Researchers advocate the use of electronic and mass media resources because, as Coohill (2006) writes, “Only by presenting them with as full a range of sources as possible will students begin to comprehend the atmospheres and mentalities of past cultures” (p. 456). When used properly, Lee (2002) contends, these resources have the ability to transform history from something that is taught by teachers to something that is experienced and uncovered by students.

Online technology has made a wide range of these previously-unavailable resources accessible. Researchers agree that the Internet can be a wonderful tool for the history educator (Coohill, 2006; DenBeste, 2003; Eamon, 2006; Lee, 2002). A variety of artwork, documents, photographs, maps, narratives, and other digitized primary sources can be uncovered within a matter of minutes. Students can be directed to utilize these resources “for numerous historical activities including identifying bias, comparing sources, and validating historical theories” (Lee, 2002, p. 505). Information can generally be found online much faster than in a library, and educators can choose from a variety of history-based projects and assignments (Eamon, 2006; DenBeste, 2003; Lee, 2002).

The Internet is not a panacea for education (Eamon 2006). Just because students have access to a wide range of material does not mean that they are equipped to do anything meaningful with it. Popular search engines such as Google (http://www.google.com/) do not necessarily present information accurately or within the proper context. Researchers note that, because anyone with Internet access can post misleading, inaccurate, or biased information online, teachers who direct students to use Web-based resources also have the responsibility to instruct students on how to evaluate online sources (Eamon, 2006; Coohill, 2006; DenBeste, 2003; Lee, 2002).

Teachers also need to be careful with the information they find on the Internet. One professor noted his embarrassment when failing to properly screen an image found online resulted in showing a picture that had been doctored to suggest that President Kennedy was assassinated by “Bert” from the children’s television show, *Sesame Street* (Coohill, 2006). To avoid similarly awkward situations, researchers recommend gathering source material from well-researched academic Web sites.

Several researchers also agree that computer-based presentation methods can be highly beneficial for history students and teachers. Coohill (2006) reported “an overwhelmingly positive response” from students when he used PowerPoint images to enhance his lectures (p. 456). He contends that well-used visual sources enable students to connect with historical figures and events, and allow them to see themselves not as casual observers, but as active participants in understanding the past. At the same time, educators also question the use of PowerPoint in the classroom, citing its potential to create “infotainment” rather than improve students’ understanding (DenBeste, 2003; Coohill, 2006). Though she is a solid advocate for using electronic presentation, DenBeste (2003) writes:

> Power Point [*sic*] can be a powerful classroom tool but it can also simply be a gimmick getting in the way of learning... its pedagogical usefulness is limited if one does not think beyond its most basic presentation abilities. (p. 496)

PowerPoint has numerous uses in the history classroom. Some professors use electronic presentation in more typical ways; they display images and, occasionally, text that coordinates with their lectures (Coohill, 2006). Others have used it to get students thinking before a lecture begins. DenBeste (2003) has used PowerPoint to display a photograph while students are entering the classroom. When class begins, students are asked to hypothesize about the person or object being shown. She also assigns students to create their own presentations to be shared with the class throughout the semester.

Researchers have made numerous suggestions in order for students and teachers to get the most out of digital presentations. Both Coohill (2006) and DenBeste (2003) recommend using only clear images, and making sure that viewers are fully aware of what is being shown. The use of complicated transitions, excessive animations, and anything beyond the bare minimum amount of text is strongly discouraged.

Rather than lament the influence that mass media has on students' perceptions of history, educators have the power to direct students on how to properly use electronic sources to better understand the past and the people in it. D'Sa (2005) believes "that classrooms today cannot be isolated from the cultural environment, and we cannot overlook the pervasiveness and influence of mass media" (p. 9). Many researchers have concluded that, because popular culture has such a large influence on students' lives, it is important that they learn to evaluate, interpret, and critically analyze what they see and hear (Marcus, 2005).

Binkiewicz (2006) asserts that popular and folk music from the past often serves as the voice of the people in their own time. She believes that, it is not only a valuable resource, but an obvious means to introduce students to studying the past. She writes:

> [Music] is a logical way to "start at the level" of students and then draw them toward the subject and issues you wish to teach them... Songs are already an important part of their daily lives... As history teachers, we may utilize that interest to engage them in historical learning. (p. 516)

Music can be used in a variety of ways in the history classroom. Educators have used music to set the mood before, during, or after a lecture (Binkiewicz, 2006). Others have found great success assigning students to work with music directly. One teacher altered the words of a popular song to help students remember the details of the Boston

Tea Party. That led her to assign students to develop their own history-themed songs set to the tune of popular music. Another educator found that students loved integrating popular and folk music into lessons centered on historical themes such as social unrest or economic inequality, so much so that they began bringing in their own music for the teacher's consideration (White & McCormack, 2006).

Of course, researchers note that music's potential will only be realized if teachers provide students with adequate information to analyze the lyrics (Binkiewicz, 2006; White & McCormack, 2006; Dzuris, 2003). Instead of simply hearing the music, students should be given a copy of the lyrics so they can better evaluate the words, and tie them to the historical concepts discussed in class (Dzuris, 2003).

Like music, film is a way to engage students in history through their own interests. Films can improve the amount of historical information that students retain through emotional and sensory connections (D'Sa, 2005). Using popular movies with a historical theme can help students develop a personal link to the material, what Marcus (2005) calls "historical empathy" (p. 62). D'Sa (2005) suggests that docudramas, films that present factual stories with the dual goals of educating and entertaining, enable teachers, "to discuss such concepts as historical accuracy, perspective taking, and revisionist history" (p. 9).

Another important benefit history educators have found is the ability of films to provide insight into what people's lives were like in the past. Films created during a particular time reflect past cultural norms, and give insight into important aspects of a society, such as culture, fashion, economics, language, and technology (Matz & Pingatore, 2005).

Given the nature of the film industry, educators must exercise great caution when selecting which films will be presented to a class (D'Sa, 2005). A film may attempt to tell the story of a historical figure or event, but that does not necessarily mean that the content of the film is historically accurate (D'Sa, 2005). Marcus (2005) notes that "Hollywood films based in history are inevitably a blend of historical record, fiction, and a filmmaker's perspective" (p. 61). He suggests that, in order to create the most valid assessment, students should be taught to question who is responsible for developing and distributing a film, the information contained within it and any potential controversy, the intended message of the film's creators, and public opinion of the film (Marcus, 2005).

Ideally, teachers believe students should have a true understanding of history, not just the ability to recite a few notable facts (Walker, 2006). Educators are increasingly finding that they can help their students develop a more meaningful connection with the past through modern technology. DenBeste concludes, "that students in a traditional course which is supplemented by online materials and various types of technology can find a love of learning and of history through 'doing' history," rather than simply reading about it (p. 501).

Data Collection and Results

Methodology

This project utilized an anonymous survey format. Teachers and students were asked to share their opinions on the use of technology and mass media resources (see Appendices A and B). The researcher collected surveys and compiled the responses on a data collection grid (see Appendix C) and analyzed the results.

Population

This study was conducted among the eighth-grade students the researcher taught and the sixth-, seventh-, and eighth-grade social studies teachers at the middle school where the researcher was student teaching.

Limitations

This project is somewhat limited because of the number of students who were able to participate. Of the 100 surveys distributed, only 16 students returned the necessary parental permission slips required to have their survey data included.

Results

Students who participated in the survey demonstrated generally positive feelings with regard to studying history. Only one student reported rarely enjoying the subject, and all considered studying history important, at least some of the time; three-fourths of students reported that they were frequently or always happy with their grades in the subject. See Figure 1.

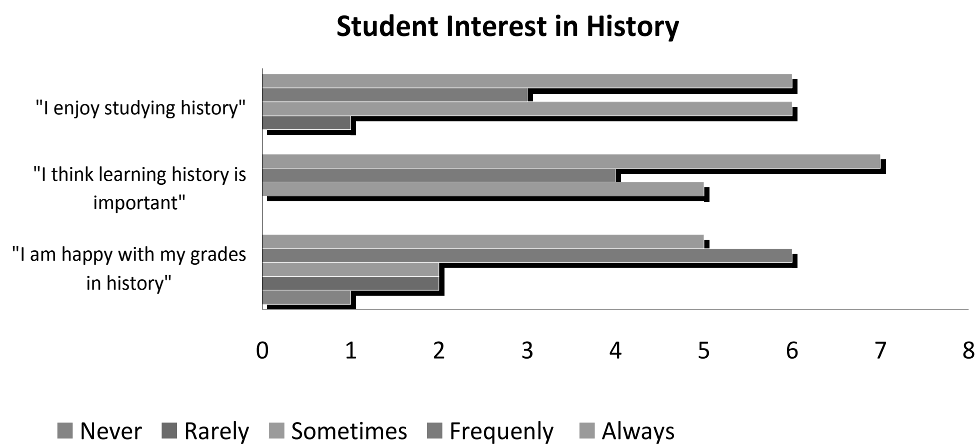


Figure 1. Responses to social studies learning survey questions 1a, 1b, and 1c.

When using technology and mass media resources, students and teachers tend to agree on what is being used and on the effectiveness of these resources, though there were some discrepancies. Both groups stated that technology resources were the most commonly used in social studies classrooms, but none of the teachers surveyed reported regularly using mass media resources. Almost all students recalled their teachers using popular film and/or television to teach social studies, which could indicate that they do not have a clear understanding of the difference between popular and documentary film. That explanation might also explain the different ways in which students and teachers assessed the effectiveness of mass media resources on student understanding of course material. With one exception, all students claimed that nontraditional resources had either a very positive, positive, or neutral effect on learning. Teachers, on the other hand, felt that the use of mass media resources would have a negative or very negative effect on student learning. See Figures 2, 3, and 4.

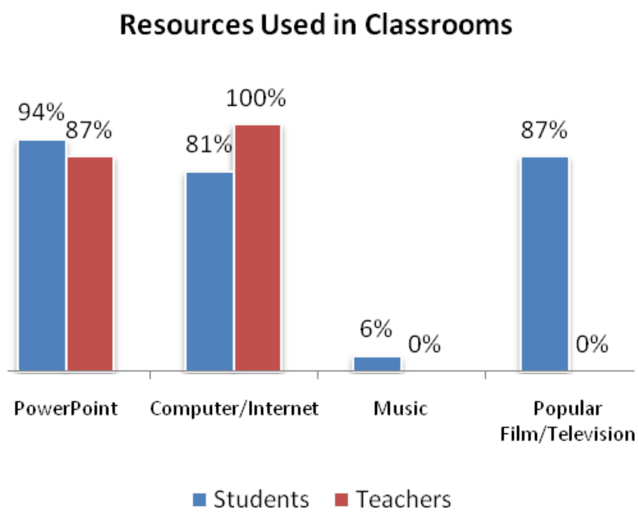


Figure 2. Responses to social studies learning survey question 2 and social studies teaching survey questions 1a, 2a, 3a, and 4a.

Student Opinion: Impact on Understanding

	Power-Point	Computer/ Internet	Music	Popular Film	Tele-vision
Very Positive	7	5	--	5	5
Positive	7	6	1	6	3
Neutral	1	3	--	1	4
Negative	--	--	--	1	--
Very Negative	--	--	--	--	--

Figure 3. Response to social studies learning survey question 4.

Teacher Opinion: Impact on Understanding					
	Power-Point	Computer/ Internet	Music	Popular Film	Tele-vision
Very Positive	7	6	--	--	--
Positive	1	2	1	3	--
Neutral	--	--	7	3	1
Negative	--	--	--	2	4
Very Negative	--	--	--	--	3

Figure 4. Response to social studies teaching survey question 5.

As shown in Figure 2, few of the teachers who participated in this survey have used multimedia resources. Teachers gave several reasons for not using music, television, and popular film, but the most common were uncertainty about how to incorporate these elements into lesson plans, and the belief that they would be ineffective as teaching tools (see Figure 5). This is also demonstrated in Figure 4, which shows that most teachers felt that popular film and television would have little to no positive effect on student learning. Students, however, believe that film and television have had a positive effect on their understanding, as shown in Figure 3. Survey results also indicate that most students are interested in learning through unfamiliar resources – particularly music. Additionally, student respondents felt that the use of technology and mass media resources had an overall, positive effect on their interest in studying history. See Figures 6 and 7.

Teacher Reasons for Not Using Resources				
	Power-Point	Computer/ Internet	Music	Popular Film/TV
Takes Too Much Time	1	--	1	--
Unsure of How to Incorporate	--	--	8	6
Students Would Not Enjoy	1	2	--	--
Consider It Ineffective	--	1	1	7
Other	--	1	--	--

Figure 5. Response to social studies teaching survey questions 1b, 2b, 3b, and 4b.

Student Interest in Unfamiliar Resources					
	Power-Point	Computer/ Internet	Music	Popular Film	Tele-vision
Very	1	1	2	--	1
Somewhat	--	--	7	1	--
No Opinion	--	--	2	1	--
Not Very	--	--	1	--	--
Not at All	--	--	2	--	--

Figure 6. Response to social studies learning survey question 5.

Student Opinion: Impact on Interest					
	Power-Point	Computer/ Internet	Music	Popular Film	Tele-vision
Very Positive	4	6	1	6	3
Positive	9	7	1	6	7
Neutral	3	3	--	2	--
Negative	--	--	--	1	1
Very Negative	--	--	--	1	--

Figure 7. Response to social studies learning survey question 3.

Conclusions and Recommendations

Conclusions

From this study, it is clear that middle school students generally enjoy studying history, and feel that technology and mass media resources improve both their interest and abilities in the subject. Teachers, meanwhile, are supportive of using technology, but are weary of using mass media resources. Their chief concern with regard to using popular film, television, and music in their classrooms is how to successfully incorporate these elements effectively.

Recommendations

An article from the National Education Association (NEA) states that, “Any teacher can integrate music into his or her curriculum” (NEA, 2003, ¶1). I believe that, since so many students expressed an interest in including music into history classes, teachers have an obligation to seek information and make an effort to incorporate this resource into their lessons. The Internet abounds with lesson plans and ideas used by other teachers which can provide additional insight into how to make the introduction of music into history instruction successful for students and teachers. Additional information can be found to assist in the inclusion of other technology and mass media resources.

Of course, given the fact that this study only examined teachers’ and students’ opinions on the effects of technology and mass media resources on student interest and performance in history, further studies are necessary to determine if their perceptions match reality. Ideally, future research would be done among a larger group of student subjects, and would measure the effects of nontraditional resources empirically. Grants to fund this sort of research are available from several sources, including the Target Local Stores Grant Program (2008) and The Louis Calder Foundation (2008).

References

Binkiewicz, D. M. (2006). Tunes of the times: Historical songs as pedagogy for recent US history. *The History Teacher, 39*(4), 515-520.

Coohill, J. (2006). Images and the history lecture: Teaching the History Channel generation. *The History Teacher, 39*(4), 455-465.

Craig, B. (2002). *American Enterprise Institute: Why students hate history*. Retrieved October 17, 2006, from the History News Network Web site, http://hnn.us/articles/1014.html

D'Sa, B. (2005). Social studies in the dark: Using docudramas to teach history. *The Social Studies, 96*(1), 9-13.

DenBeste, M. (2003). PowerPoint, technology and the Web: More than just an overhead projector for the new century? *The History Teacher*, *36*(4), 491-504.

Dzuris, L. (2003). Using folk songs and ballads in an interdisciplinary approach to American history. *The History Teacher, 36*(3), 331-342.

Eamon, M. (2006). A "genuine relationship with the actual:" New perspectives on primary sources, history and the Internet in the classroom. *The History Teacher*, *39*(3), 279-314.

Fleming, R. (2002). A class kids love to hate. Retrieved October 17, 2006, from the Common-Place Web site, http://www.common-place.org/vol-03/no-01/school/

Lee, J. K. (2002). Digital history in the history/social studies classroom. *The History Teacher, 35*(4), 503-517.

Louis Calder Foundation, The (2008). *Requests for proposals*. Retrieved May 22, 2008, from http://www.louiscalderfdn.org/rfp.html

Marcus, A. S. (2005). "It is as it was:" Feature film in the history classroom. *The Social Studies, 96*(2), 61-67.

Martin, E. L. (2006). The problem with any world history textbook: James Loewen and the world history survey. Retrieved October 16, 2006, from History Cooperative Web site, http://www.historycooperative.org/journals/whc/3.2/martin.html

Matz, K. A., & Pingatore, L. L. (2005). Reel to real: Teaching the twentieth century with classic Hollywood films. *Social Education, 69*(4), 189-192.

National Center for Education Statistics. (2001). *The nation's report card: U.S. history 2001* (Publication NECS 2002-483). Retrieved September 15, 2006, from the National Center for Education Statistics Web site, http://nces.ed.gov/

National Education Association (2003). *Connect with music: Lessons any teacher can teach!* Retrieved May 22, 2008 from http://www.nea.org/lessons/2003/tt030407.html

Schick, J. (1991). What do students really think of history? *The History Teacher*, *24*(3), 331-342.

Singleton, L. R., & Giese, J. R. (1999, July-August). Using online primary sources with students. *The Social Studies, 90*, 148-151.

Target Corporation. (2008). *Community: Local store grants*. Retrieved May 22, 2008, from http://sites.target.com/site/en/corporate/page.jsp?contentId=PRD03-001818

Walker, T. R. (2006). Historical literacy: Reading history through film. *The Social Studies, 97*(1), 30-34.

White, C., & McCormack, S. (2006). The message in the music: Popular culture and teaching in social studies. *The Social Studies, 97*(3), 122-127.

APPENDIX A

SOCIAL STUDIES TEACHING SURVEY

1. Do you currently use Microsoft PowerPoint or other electronic presentation software in your classroom?

    a. If so, how frequently?

    ___ Always ___ Sometimes ___ Never
    ___ Frequently ___ Rarely

    b. If not, why (check all that apply)?

    ___ Utilizing PowerPoint requires too much preparation time.
    ___ I am unsure how to incorporate PowerPoint into my lessons.
    ___ I don't think my students enjoy/would enjoy PowerPoint presentations.
    ___ I don't think PowerPoint presentation are an effective teaching tool.
    ___ Other:

2. Do you have students conduct Internet activities or research to uncover historical information?

    a. If so, how frequently?

    ___ Always ___ Sometimes ___ Never
    ___ Frequently ___ Rarely

    b. If not, why (check all that apply)?

    ___ Utilizing PowerPoint requires too much preparation time.
    ___ I am unsure how to incorporate PowerPoint into my lessons.
    ___ I don't think my students enjoy/would enjoy PowerPoint presentations.
    ___ I don't think PowerPoint presentation are an effective teaching tool.
    ___ Other:

    c. Do you allow them to use popular search engines such as Google to find information or are they restricted to specific academic sites such as American Memory from the Library of Congress?

    ___ I think using popular search engines to find sources is acceptable.
    ___ I only allow my students to use academic sites.

d. Prior to having them conduct research online, did you instruct students on how to detect bias and misinformation?

___ Yes
___ No

3. Do you use popular music in your classroom?

a. If so, how frequently?

___ Always
___ Frequently
___ Sometimes
___ Rarely
___ Never

b. If not, why?

___ Utilizing popular music requires too much preparation time.
___ I am unsure how to incorporate popular music into my lessons.
___ I don’t think my students enjoy/would enjoy the inclusion of music.
___ I don’t think popular music is an effective teaching tool.
___ Other:

4. Do you use popular film or television in your classroom?

a. If so, how frequently?

___ Always
___ Frequently
___ Sometimes
___ Rarely
___ Never

b. If not, why?

___ Utilizing popular film or television requires too much preparation time.
___ I am unsure how to incorporate popular film or television into my lessons.
___ I don't think my students enjoy/would enjoy the inclusion of popular film or television.
___ I don't think popular film or television are effective teaching tools.
___ Other:

5. What effect, if any, do you believe the following have on student interest in studying history:

	Very Positive	Positive	Neutral	Negative	Very Negative
PowerPoint					
Internet Research or Computer Activities					
Music					
Popular Film					
Television					

APPENDIX B

SOCIAL STUDIES LEARNING SURVEY

Please answer the following questions based on your personal preferences:

1. Please answer the following based on your personal preferences:

   a. I enjoy studying history:

___ Always	___ Sometimes	___ Never
___ Frequently	___ Rarely	

   b. I think learning history is important:

___ Always	___ Sometimes	___ Never
___ Frequently	___ Rarely	

   c. I am happy with my grades in history:

   ___ Always
   ___ Frequently
   ___ Sometimes
   ___ Rarely
   ___ Never

2. Have your social studies teachers ever used any of the following during lessons (check all that apply):

    a. ___ PowerPoint presentations
    b. ___ Music
    c. ___ Popular film and/or television
    d. ___ Internet research/computer activities

3. For those items you checked above, indicate how much you think each of the following helped improve your interest in studying history:

	Very Positive	Positive	Neutral	Negative	Very Negative
PowerPoint					
Internet Research or Computer Activities					
Music					
Popular Film					
Television					

4. For those items checked above, indicate how much you think each of the following helped improve your understanding of history:

	Very Positive	Positive	Neutral	Negative	Very Negative
PowerPoint					
Internet Research or Computer Activities					
Music					
Popular Film					

Television					

5. For those items <u>not</u> checked above, indicate your level of interest in having these items included in your social studies classes:

	Very Interested	Somewhat Interested	No Opinion	Not Very Interested	Not Interested at All
PowerPoint					
Internet Research or Computer Activities					
Music					
Popular Film					
Television					

APPENDIX C

DATA COLLECTION GRID

SOCIAL STUDIES LEARNING SURVEY (STUDENT SURVEY)																	
ANSWER CHOICE	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	TOTALS
1A: I ENJOY STUDYING HISTORY																	
A						1		1		1	1		1	1			6
F							1					1			1		3
S	1	1	1	1	1											1	6
R									1								1
N																	0
1B: I THINK LEARNING HISTORY IS IMPORTANT																	
A			1			1		1		1			1	1	1		7
F				1			1				1					1	4
S	1	1			1				1			1					5
R																	0
N																	0
1C: I AM HAPPY WITH MY GRADES IN HISTORY																	
A	1		1							1		1	1				5
F				1	1	1			1					1	1		6
S							1	1									2
R		1									1						2
N																1	1
2: HAVE YOUR SOCIAL STUDIES TEACHERS EVER USED ANY OF THE FOLLOWING																	
A	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		15
B															1		1
C	1	1	1	1	1	1	1	1			1	1	1	1	1		13
D	1	1	1	1	1	1	1	1		1	1	1		1	1	1	14
3: POWERPOINT																	
VP						1				1				1	1		4
P	1			1	1		1	1	1			1	1				8
NU		1	1								1						3
NE																	0
VN																	0
3: COMPUTER/INTERNET																	
VP	1									1	1			1	1	1	6
P			1			1	1	1				1					5
NU		1		1	1												3
NE																	0
VN																	0
3: MUSIC																	
VP															1		1
P																	0
NU																	0
NE																	0
VN																	0

3: POPULAR FILM																	
VP			1				1				1		1	1	1		6
P	1			1				1				1					4
NU						1											1
NE		1															1
VN					1												1
3: TELEVISION																	
VP			1				1							1	1		4
P	1			1	1	1		1			1	1					7
NU		1															1
NE																	0
VN																	0
4: POWERPOINT																	
VP				1	1					1	1		1	1	1		7
P	1		1			1	1	1	1			1					7
NU		1															1
NE																	0
VN																	0
4: INTERNET AND COMPUTER																	
VP						1				1	1			1		1	5
P	1			1			1	1				1			1		6
NU		1	1		1												3
NE																	0
VN																	0
4: MUSIC																	
VP																	0
P															1		1
NU																	0
NE																	0
VN																	0
4: POPULAR FILM																	
VP			1				1				1		1	1			5
P	1				1	1		1				1			1		6
NU		1															1
NE				1													1
VN																	0
4: TELEVISION																	
VP			1				1				1			1	1		5
P	1							1				1					3
NU		1		1	1	1											4
NE																	0
VN																	0
5: POWERPOINT																	
VI																	0
SI																	0
NO																	0
NV																	0
NI																	0
5: COMPUTER/INTERNET																	
VI													1				1
SI									1								1
NO																	0
NV																	0
NI																	0
5: MUSIC																	

VI													1			1	2
SI	1			1	1					1	1			1			6
NO						1	1	1	1								4
NV												1					1
NI		1	1														2
5: POPULAR FILM																	
VI																1	1
SI									1	1							2
NO																	0
NV																	0
NI																	0
5: TELEVISION																	
VI													1			1	2
SI										1							1
NO									1								1
NV																	0
NI																	0

SOCIAL STUDIES TEACHING SURVEY (TEACHER SURVEY)

ANSWER CHOICE	T1	T2	T3	T4	T5	T6	T7	T8	TOTALS
1A: POWERPOINT FREQUENCY									
A	1		1			1			3
F				1	1			1	3
S							1		1
R		1							1
N									0
1B: IF NOT USED, WHY?									
TIME		1							1
UNSURE									0
NOT ENJOY		1							1
INEFFECTIVE									0
OTHER									0
2A: COMPUTER/INTERNET FREQUENCY									
A									0
F			1	1		1			3
S	1	1			1		1	1	5
R									0
N									0
2B: IF NOT, WHY?									
TIME									0
UNSURE									0
NOT ENJOY		1			1				2
INEFFECTIVE		1							1
OTHER								1	1
2C: SEARCH ENGINE OR ACADEMIC									
GOOGLE	1	1		1	1	1	1	1	7
ACADEMIC			1						1
2D: DETECTING BIAS INSTRUCTION									
YES			1	1		1			3
NO	1	1			1		1	1	5
3A: POPULAR MUSIC FREQUENCY									
A									0
F									0
S									0
R	1			1	1			1	4

N		1	1			1	1		4
3B: IF NOT, WHY?									
TIME	1								1
UNSURE	1	1	1	1	1	1	1	1	8
NOT ENJOY									0
INEFFECTIVE		1							1
OTHER									0
4A: POPULAR FILM/TELEVISION FREQUENCY									
A									0
F									0
S									0
R	1		1	1		1		1	5
N		1			1		1		3
4B: IF NOT, WHY?									
TIME									0
UNSURE	1	1	1	1	1			1	6
NOT ENJOY									0
INEFFECTIVE	1	1		1	1	1	1	1	7
OTHER									0
5A: EFFECT POWERPOINT									
VP	1		1	1	1	1	1	1	7
P		1							1
NU									0
NE									0
VN									0
5B: EFFECT COMPUTER/INTERNET									
VP			1	1	1	1	1	1	6
P	1	1							2
NU									0
NE									0
VN									0
5C: EFFECT MUSIC									
VP									0
P								1	1
NU	1	1	1	1	1	1	1		7
NE									0
VN									0
5D: EFFECT POPULAR FILM									
VP									0
P	1		1					1	3
NU				1	1	1			3
NE		1					1		2
VN									0
5E: EFFECT TELEVISION									
VP									0
P									0
NU			1						1
NE	1			1	1			1	4
VN		1				1	1		3