Culminating Experience Action Research Projects, Volume 5, Spring 2004

Edited by
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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 2004.

Deborah A. McAllister

Susan M. Bothman

October 2005

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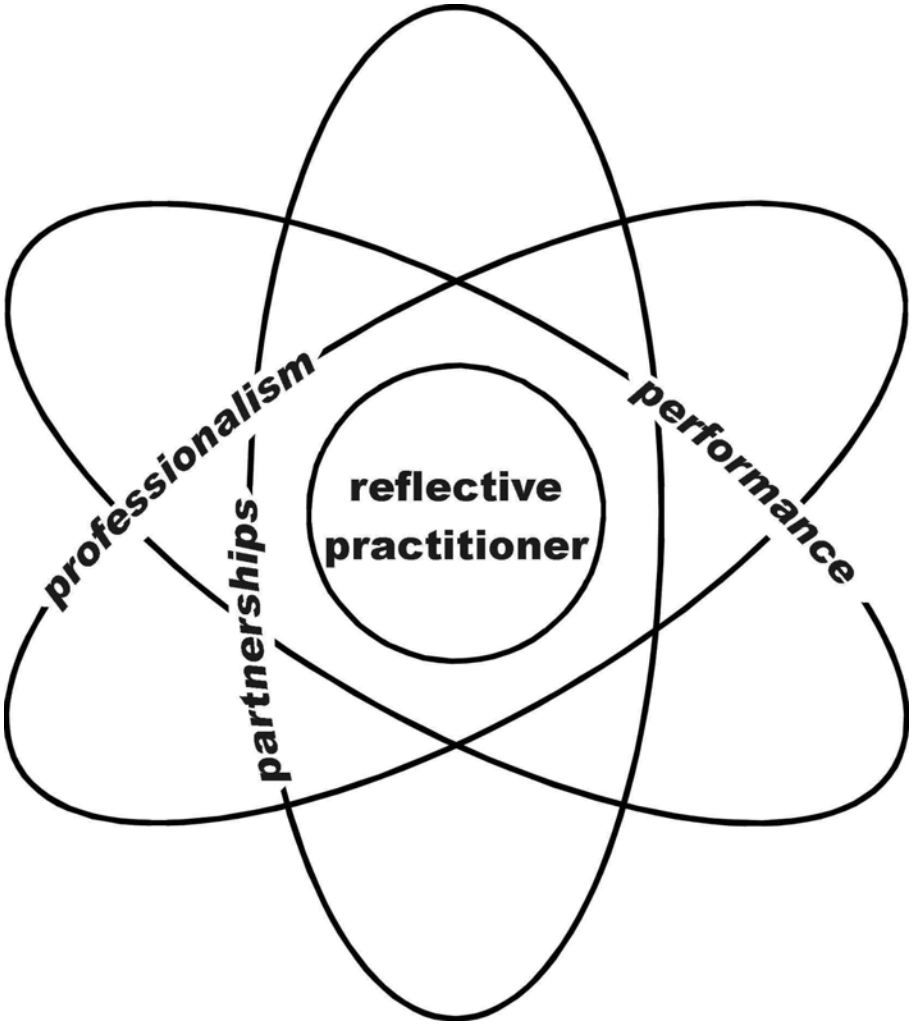

ATTENTION: If you are a student with a disability (e.g., physical, learning, psychiatric, vision, hearing, etc.) and think that you might need special assistance or a special accommodation in this class or any other class, call the Office for Students with Disabilities/College Access Program at 423-425-4006 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 423-425-2678.

Educ 590 Culminating Experience – Spring 2004
Section 001, By Appointment, 3 credit hours

Instructor

Dr. Deborah A. McAllister
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Office hours: M 12:00 p.m. to 5:00 p.m., Tu 1:30 p.m. to 3:30 p.m., or by appointment
Phone: 423-425-5376 (Office), 423-842-1607 (Home)
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Graduate Assistant: Mike Clark; UHON Student Assistant: Andy Basler

Catalog description

Directed research or development project under faculty supervision. *Prerequisite: Admission to candidacy, approval of M.Ed. committee.*

Recommended text and web sites

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

Online Writing Lab at Purdue University. (2002, September). *Using APA format.* Retrieved December 31, 2003, from the Purdue University OWL Web site: http://owl.english.purdue.edu/handouts/research/r_apa.html

Degelman, D., & Harris, M. L. (2003, November 13). *APA style essentials.* Retrieved December 31, 2003, from the Vanguard University Web site: http://www.vanguard.edu/faculty/ddegelman/index.cfm?doc_id=796

University of Wisconsin - Madison Writing Center. (2003). *Writer's handbook: APA documentation style.* Retrieved December 31, 2003, from the University of Wisconsin - Madison Writing Center Web site: 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.

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. Submit a corrected copy.
   b. Plan to use one of your learning assessments from your first placement as your case study. Submit an outline of the topic, what will be assessed, who will be assessed, how and when assessment will occur, and what instruments will be used. Submit an outline.
   c. Design a new project of your own choosing. Submit an outline for approval.

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/). 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 print Form C for you to sign. Review the information and forms on the IRB web site for additional details. 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.**

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:
   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 ERIC advanced search should be used to locate references in educational journals and documents. See http://www.eduref.org/ (search the ERIC database) or http://www.eric.ed.gov/ to get to the advanced search (located at http://www.ericfacility.net/servlet/com.artesiatech.servlet.search.SearchServlet?action=6). **You must use a page number or a paragraph number for all direct quotes. All references should contain complete page numbers.**
   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 tables and figures. 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. Instrument(s) are placed in individual appendices. Word process instruments from the Web, books, etc., but place a citation on the page and in the reference list.

5. Communication:
    1. 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://www.utc.edu/itd/email/stu_saindex.shtml for more details.
    2. Web access to check course announcements and post messages to the discussion forum on Blackboard a minimum of once per week. See http://bb2.utc.edu/.

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 university student lab in Siskin Memorial and/or the University Center.

7. Please note:
    a. Ask another person to proofread your work for correct syntax and semantics before submitting it. You are encouraged to 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.

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 01/05/04 Student teacher meeting - M 01/05, 8:30 a.m. – 5:00 p.m. 1st placement begins - W 01/07	Check email account; access Blackboard. Meet at 12:00 p.m. for Educ 590.
2	Week of 01/12/04	Case study option selected; proposed outline posted to discussion forum. **Paperwork submitted for IRB approval (Exemption/Form A, Expedited Review/Form B).** **Instruments must be included with both Form A and Form B.** **Parental consent form and student assent form must be included with Form B.** **Copy of IRB approval placed in my mailbox in Hunter 311, when received.**
3	Week of 01/19/04 MLK Holiday - M 01/19 (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 01/26/04	Begin data collection, with IRB approval.
5	Week of 02/02/04	Case study work continues.
6	Week of 02/09/04 Holiday – F 02/13 (HCDE)	Case study work continues.
7	Week of 02/16/04 Holiday – M 02/16 (HCDE) First placement ends - Th 02/19 Student teacher meeting - M 02/20, 8:30 a.m. – 5:00 p.m.	Data collection is complete.
8	Week of 02/23/04 Second placement begins – M 02/23	Writing of case study.
9	Week of 03/01/04	Writing of case study.
10	Week of 03/08/04 HCDE Teacher Professional Development - ThF 03/11 – 03/12 End of 1st quarter - F 03/12 (HCDE) Spring break (UTC)	Writing of case study.
11	Week of 03/15/04	Writing of case study.
12	Week of 03/22/04	Writing of case study.
13	Week of 03/29/04	Writing of case study.

14 Week of 04/05/04 Proofreading of case study.
TCAP – M-Th 04/05 – 04/08
Holiday – F 04/09 (UTC/HCDE)

15 Week of 04/12/04 **Completed case study due, F 04/16/04, 5:00 p.m.**
Spring break (HCDE) **Case study assembled in a single file; placed in digital drop box.**

16 Week of 04/19/04 **Late case studies accepted.**
Second placement ends - F 04/23

17 Week of 04/26/04
Student teacher meeting - M 04/26, 2:00 p.m. – 5:00 p.m.
IRB Form C completed when we meet
W 04/28/04 - Grades due for graduation candidates, 12:00 p.m. **on 04/26 (1:30 p.m.?).**
Th 04/29/04 - Grades due for all other students, 12:00 p.m. **Late case studies accepted;**
Su 05/02/04 - Commencement, 2:00 p.m. **not guaranteed to be graded by 04/28.**

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 31, 2003, 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.

Professional Organizations (examples)

American Council on the Teaching of Foreign Languages. (2003). Retrieved January 2, 2004, from http://www.actfl.org/
Council for Exceptional Children. (2003, December 22). Retrieved January 2, 2004, from http://www.cec.sped.org/
International Reading Association. (2003). Retrieved January 2, 2004, from http://www.ira.org/
International Society for Technology in Education. (2003, December 16). Retrieved January 2, 2004, from http://www.iste.org/
National Art Education Association. (n.d.). Retrieved January 2, 2004, from http://www.naea-reston.org/
National Association for Music Education. (n.d.). Retrieved January 2, 2004, from http://www.menc.org/
National Association for the Education of Young Children. (2003). Retrieved January 2, 2004, from http://www.naeyc.org/
National Council for the Social Studies. (2003). Retrieved January 2, 2004, from http://www.ncss.org/
National Council of Teachers of English. (2003). Retrieved January 2, 2004, from http://www.ncte.org/
National Council of Teachers of Mathematics. (2003). Retrieved January 2, 2004, from http://www.nctm.org/
National Middle School Association. (n.d.). Retrieved January 2, 2004, from http://www.nmsa.org/
National Science Teachers Association. (2004). Retrieved January 2, 2004, from http://www.nsta.org/

Rubrics (examples)

Barnard, P. (2003, December 3). *Learning central @ Pioneer: Rubric resources.* Retrieved January 2, 2004, from http://www.asd.wednet.edu/pioneer/barnard/index.htm
Chicago Public Schools. (2000). *The rubric bank.* Retrieved January 2, 2004, 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 January 2, 2004, from http://intranet.cps.k12.il.us/Assessments/Ideas_and_Rubrics/Create_Rubric/create_rubric.html
Coxon, E. (2003, October 12). *The staff room for Ontario's teachers.* Retrieved January 2, 2004, from http://www.quadro.net/~ecoxon/
LessonPlanZ.com. (2003, December 24). Retrieved January 2, 2004, from http://lessonplanz.com/ (use 'rubric' as a search term)

South Dakota State University. (n.d.). *Rubric template.* Retrieved January 2, 2004, from http://edweb.sdsu.edu/triton/july/rubrics/Rubric_Template.html

Teach-nology. (2003). Rubric, rubrics, teacher rubric makers. Retrieved January 2, 2004, from http://teachers.teach-nology.com/web_tools/rubrics/

The Landmark Project. (n.d.). *Rubric construction set.* Retrieved January 2, 2004, from http://landmark-project.com/classweb/rubrics/4x4rubric.html

Surveys (examples)

The International Consortium for the Advancement of Academic Publication. (2003, August 23). *Resources for methods in evaluation and social research.* Retrieved January 2, 2004, from http://gsociology.icaap.org/methods/

University of Southern Indiana Sociology Department. (2003). *Social research and statistical links.* Retrieved January 2, 2004, from http://www.usi.edu/libarts/socio/stats.htm

Bibliography

American Association for the Advancement of Science. (1993). *Benchmarks for science literacy*. Retrieved January 2, 2004, from http://www.project2061.org/ (choose Benchmarks On-line).

Association of College and Research Libraries. (2003, October 30). *Information literacy competency standards for higher education*. Retrieved January 2, 2004, from http://www.ala.org/acrl/ilstandardlo.html

Creswell, J. W. (1994). *Research design: Qualitative & quantitative approaches*. Thousand Oaks, CA: Sage Publications, Inc.

Educator's reference desk. (n.d.). Retrieved January 2, 2004, from http://www.eduref.org/ (contains material previously in the database of the ERIC Clearinghouse on Information and Technology; also see http://www.eric.ed.gov/).

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. (2003, August 4). *Standards- grademarkers- benchmarks*. Retrieved January 2, 2004, from http://www.hcde.org/standards/stindex.html

Johnson, A. P. (2002). *A short guide to action research*. Boston, MA: Allyn & Bacon.

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

McAllister, D. A. (2003). *Faculty page – McAllister*. Retrieved January 2, 2004, 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 31, 2003, 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. (1996). *National science education standards*. Retrieved January 2, 2004, 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 frameworks*. Retrieved January 2, 2004, from http://www.state.tn.us/education/ci/cistandards.htm

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.

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.

Media Literacy and Reading Comprehension:
An Action Research Project

Joellen K. Archung

EDUC 590
4/16/04

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-066.

Introduction

Reading without comprehension is like going to Six Flags, but being too small to ride the rides. This was my experience with reading. I could read the words on the page, but I could not form a mental picture or cohesive image of the author's point. In fact, my reading comprehension was so poor that I was placed in a resource room with other poor readers. During this time, my teacher would have us read aloud, and she would correct our mispronunciations as we made them. This exercise did little to improve my reading comprehension.

When I got to junior high, I relied on Cliff Notes to help me pass a test or write a paper. They were great because I no longer had to read the assigned books—just the Cliff Notes. They not only gave me a summary of the chapters, but also explained what the chapters were about. The Cliff Notes series was a great help, though this didn't solve my problem. I still could not connect the words together to obtain meaning.

In high school, I decided it was time to do something about my reading comprehension problem. Now might be a good time to mention that I was a movie fanatic; most poor readers probably are. If I watched a movie I thought was especially good, I would want more. I would want to know why an actor looked at another actor in a certain way or what caused a particular action. Shock of all shocks (at least to my parents), I would read the book. I already knew the main action, so the book filled in the gaps. It provided the small details and background information that the movie could not. However, without the movie, I would not have read the book. The movie allowed me to form the mental picture that permitted me to understand the book. It provided an opportunity for independent reading with comprehension, without the help of Cliff Notes or a resource teacher. It was a breakthrough.

This pattern of coupling books with their movie counterparts continued throughout my high school years. I do not give it sole credit for my reading comprehension improvement. My friends and family were patient teachers, and I wanted to get into a good college, so I was motivated. These factors are important, but the connection between movie watching and reading comprehension was significant in my success as a reader.

Rationale

My story is not unique. There are many reluctant readers in our schools. "Some estimates place nearly 40% of seventh graders in this category: students who have tuned out intellectually...These unmotivated students are sometimes also unskilled readers" (Hobbs, 2001, p. 45). If we give these tuned-out students an opportunity to apply skills they have already mastered to reading comprehension, then their reading comprehension skills will improve.

"For middle-school students who don't read well, media and computer technologies seem effortless and more 'natural' as compared with the laborious process of decoding print symbols and forming images in the mind's eye" (Hobbs, 2001, p. 45). In other words, these students have no trouble applying critical thinking skills to technology, but fail to apply these skills to reading. Kylene Beers has documented the traits of reluctant readers and revealed that these students do not automatically visualize what they read (Beers, 1998). It is my contention that reading comprehension will improve through the use of media literacy activities.

What We Know

Middle-school students identified as reluctant readers are often unable to form a visual interpretation of textual material. These pupils are often unable to comprehend, "the author's use of details, skip too many words, resist interpreting longer sentences, and fill in gaps in understanding by using their own personal experience rather than information presented in the

text" (Hobbs, 2001, p. 48). When these low-level readers realize that their limited perception is inadequate, they continue reading word by word and hope that clarity will miraculously materialize (Richardson & Morgan, 2003).

To enter actively into the practice of reading, readers must be able to visualize. They must be able to convert printed symbols into actions, events, and ideas that are clearly perceptible to the imagination (Messaris, 1997). An adept reader does all this unconsciously, but this experience is unknown to many students (Baskin, 1997). Beers has documented the characteristics of unskilled readers and discovered that these learners do not automatically visualize what they read. These are the pupils who need directed opportunities to apply the comprehension strategies of critical thinking, self-monitoring, and visualization (Hobbs, 2001). The inability to create a cohesive mental image will prevent these middle-school readers from achieving high levels of reading comprehension (Richardson & Morgan, 2003).

Problem Statement

Increased use of visual/media literacy (film, television, comics, graphs, charts, pictures, etc.) will increase reading comprehension for all readers.

Review of the Literature

Defining Visual/Media Literacy

Visual/media literacy is the ability to comprehend and create visual and/or audio messages (International Visual Literacy Association, 1998). It includes but is not limited to films, web sites, television, magazines, newspapers, comics, graphic organizers, and music. Each of these is considered textual—they communicate and supply meaning to the 'reader' (Hobbs, 2001). I will use the terms *visual literacy* and *media literacy* interchangeably.

Visual Media is Popular and Motivating

Unmotivated/unskilled readers are those that have tuned out intellectually (Hobbs, 2001). In order to get them tuned in, teachers are turning to visual media, which is both well-liked by students and motivating to them. "*English Journal* pages have been filled with reports from teachers using popular films, music lyrics, advertising, magazine photographs, tabloid newspapers, cartoons, animation, and more in the process of stimulating students' speaking, writing, viewing, reasoning and critical thinking skills" (Hobbs, 1998, p. 49). Why are these media so popular? Richardson and Morgan believe it is because they provide multisensory stimulation—we watch them, we listen to them, and we are entertained by them. In a study of the effects of closed-captioned television on reading skills, 90% of the students expressed an interest in reading with the aid of closed-captioned television; several stated that it was their favorite school activity (Shiring, 1997). "Librarians and other educators interested centrally in motivating the habit of reading, ...agree that comics develop both literacy and language competency" (Heath & Bhagat, 1997). According to Baskin, computer graphics can motivate, dramatize, and empower the user through investigation, experimentation, and analytical resolution. When educators use media literacy as a fundamental element in reading and writing, the quality of student engagement and accomplishment has been shown to improve significantly (Baines & Price, 2002).

Film and Literature Are Similar

Film and literature are alike in several ways. Baines points out that both take the form of a narrative: they are created to tell a story. He also claims that both mediums require the viewer or reader to ignore structure to persistently derive meaning. In other words, the viewer must not focus on a director's camera angles and cuts, and the reader must not focus on literary construction so that the overall message gets through. The viewer and reader may go back to

these structural elements for a more in-depth look at the work after the action is understood. "A third similarity is that much of the jargon of literary criticism is equally applicable to film. Plot, symbolism, theme, tone, characterization, foreshadowing, and setting are terms as applicable to film as to text" (Baines, 1997). Hobbs uses episodes of *The Simpsons* to make comparisons to Mark Twain's essays and speeches. After closely examining an episode where one of the characters runs for governor, the students form small discussion groups to answer the following questions:

- What is the author's purpose?
- What lifestyles, values and points of view are represented here?
- What techniques are used to attract and hold your attention?
- What background knowledge (not presented in the text) helps enhance your understanding of this message?
- What historical, political or social events does this message connect to? Which character is presented most sympathetically? (Hobbs, 1998)

After reviewing their answers, the learners are presented an essay from Mark Twain's, *Life as I Found It*, and go through the exercise again. The students are able to apply the same critical thinking skills to both mediums due to their comparable nature—both use the genre of social criticism.

Media Literacy Improves Reading and Language Skills

"Visual literacy helps build experiences necessary to thinking and learning. Teachers know that when they make use of visual aids such as graphs, charts, and pictures, they ensure and reinforce learning for many students" (Richardson & Morgan, 2003). Many educators are using filmed adaptations as a tool for expanding the comprehension abilities of low-achieving pupils. Baines cites several sources to support this assertion. Some have found filmed adaptations helpful in filling in the gaps for reluctant readers. Others propose that using movies will help advance the language skills of students, and further contend that videos may help low-

achieving pupils to build mental representations that are richer than those resulting exclusively from text (Baines, 1997).

Television, comic books, and computer graphics were also cited as excellent devices to help solidify thoughts and feelings so that reading and writing become less off-putting to hesitant readers (Baines & Price, 2002). Television can be utilized in the classroom to establish themes and broaden curriculum, concretize complex theories with engaging visuals, and link reading materials to related films (Shiring, 1997). Comic books help students build comprehension skills due to the need for interpretation of both words and pictures. Comic books rely heavily on gaps and fill-in. "Readers understand them by bringing to bear both their real-world information and creativity in image building and meaning making" (Heath & Bhagat, 1997). Computer graphics can function as clarifiers, simplifiers, and models. In a high school science class, students were able to access a visual database that professional astronomers use in order to complete a science lesson involving a collision between a comet and Jupiter (Baskin, 1997). "Visual media . . . contribute to the development of human intellect by enhancing the users' mental skills" (Messaris, 1997). It promotes visualization skills, improves comprehension, builds language competence, and provides opportunities for learning.

Cautions

Many caution the use of media in the classroom. One source suggested that parents and educators should try to convince children that reading can be as entertaining as television and as exciting as a video game in an attempt to wean children from the instant-gratification fix that television provides (Green, Kandyba, McDonald, & Stevens, 2000). Many studies report that children are watching more television than ever before. This is causing several literacy organizations to sponsor "no TV" days because, "as Elley reports in an international literacy

study, those who watch TV a lot tend to score at lower levels of literacy than those who watch less" (Richardson & Morgan, 2003). Another source criticized the use of film with literature because often teachers would ask students to compare the film to the literature in a non-engaging way or allow the students to watch the film as a reward for getting through the book (Baines, 1997). The pupils are at varying degrees of passivity in both instances. Thus, the visual media is not being used as a learning tool, but rather as a treat. In addition, films often simplify the dialogue, plot, characters, and theme (Richardson & Morgan, 2003). Some middle school teachers worry that relying too much on audiotapes and videotapes gives their low-level readers practice in viewing and listening, not reading and writing (Beers & Samuels, 1998). In spite of all this, if visual literacy is used properly and sparingly, it can improve comprehension.

Data Collection and Results

Measurement

It is my assertion that visual/media literacy, included in a unit designed for teaching Elizabeth George Speare's *The Sign of the Beave,r* will improve reading comprehension. As stated earlier, visual/media literacy is the ability to comprehend and create visual and/or audio messages (International Visual Literacy Association, 1998). "Sinatra calls visual literacy the first and most pervasive literacy. Sinatra's model of literacy development suggests the interactive relationship of visual literacy with the oral and written literacies" (Richardson & Morgan, 2003). The media images I will incorporate into my lessons for the study group include film clips, photographs, pictures, student art, audiotapes, and a graphic organizer—a visual roadmap of the book.

Reading comprehension is the ability to reconstruct the intended meaning of a written piece of communication: it is accurately understanding what is written.

The students will participate in a 3-week unit plan that will include character analysis, theme, plot, and setting of The Sign of the Beaver. Both the experimental group and the control group will complete a pre-test and a post-test that measures reading comprehension.

Intervention

My intervention consists of several forms of media literacy: film clips, photographs, pictures, student art, audiotapes, and a graphic organizer—at least one type will be used for each day of the unit to help the sample group visualize the storyline.

Design

My inquiry will consist of a 3-week unit plan on *The Sign of the Beaver*. I will have an experimental group and a control group. To ensure that the groups are comparable, I will analyze their previous reading scores.

All students from both groups will complete a pre-test and a post-test (see Appendix A). The testing materials were compiled from A *Guide for Using The Sign of the Beaver in the Classroom*.

The control group will not be taught with any visual/media literacy. Instead, their unit will be supplemented with literary notes and guided class discussions. Whenever I use visual literacy to enrich the experimental group's lesson, I will replace that section with material I get from literary notes found online and in teacher's guides, such as Teacher Created Materials, Inc.

Analysis

Both the pre-test and the post-test were based on a numerical grade of the percent correct. I analyzed the results of both tests using repeated-measures analysis of variance (ANOVA). Both groups significantly improved from pre-test to post-test condition ($F=12$, $p < .01$). (see Figure 1.)

There was no significant difference between groups (Experimental vs. Control) over the two conditions (Pre-test vs. Post-test) ($F=.050$, $p > .05$).

Figure 1. Pre-test versus post-test results.

Conclusions and Recommendations

After completing this study, I believe that when students are participating in a fun activity, they are learning and scores do improve. There was, however, no significant difference in improvement between groups. Thus, I must conclude that the use of media literacy did not improve reading comprehension. I do recommend that teachers include both media literacy and literary notes with guided discussion into their classroom curriculum to aid in reading comprehension.

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Appendix A

Pre-test/Post-test: <u>The Sign of the Beaver</u>

Matching: Match the Native American word with its English meaning.

1. _____ seba	a. grandson
2. _____ piz wat	b. white brother
3. _____ nkweniss	c. tomorrow
4. _____ medabe	d. dog
5. _____ aremus	e. good for nothing

True or False: Write true or false next to each statement below.

1. _____ Matt may have died without the help of Saknis and Attean.
2. _____ Matt had nothing to give the Indians in return for them saving his life.
3. _____ Matt taught Attean new hunting techniques that the Indian was happy to learn.
4. _____ Matt and Attean were nearly the same age.
5. _____ The Maine Indians were on white man's land.
6. _____ Indians lost much of their hunting ground because of white settlers.
7. _____ Attean's dog was a valuable hunting dog.
8. _____ White men killed Attean's mother.
9. _____ Matt and Attean grew to respect each other.
10. _____ Matt's father was gone about eight weeks.

Dear Parents,

I am currently working on a Masters degree of Education through the University of Tennessee at Chattanooga. As part of the program requirements, I must conduct a research project. I have chosen to examine methods of improving reading comprehension. I am requesting permission for your child to participate. The purpose of this study is to determine which method of instruction is most effective.

The students will be randomly divided into two groups, an experimental group and a control group. One group will receive instruction supplemented with audio/visual aids and the other group will receive instruction supplemented with literary notes. I will give a pretest and a posttest during the research period in order to compare results and to determine which method produced the greatest improvement in reading comprehension. These tests will not affect your child's regular grades. Also, their names will be kept anonymous. I ask that each child try to do his/her best and to participate.

Participation in this study is voluntary. Should you decide to allow your child to participate, he/she may withdraw from the study at any time without penalty. In addition, it will in no way affect your child's class grade. At the end of the study, a copy of the results will be available for parents and teachers to view. Should you have any comments, concerns or questions feel free to call me at (423) 877-7324.

Please sign and return this form. Thank you for your cooperation and support.

Sincerely,

_____ 4/16/04
Joellen K. Archung
Principal Investigator
White Oak Elementary

I give my child permission to participate in this study.

_____ _____
Parent Date

_____ _____
Witness Date

I DO NOT give my child permission to participate in this study.

_____ _____
Parent Date

_____ _____
Witness Date

Student Assent Form

I, _____, am willing to participate in a research project to be carried out by Ms. Archung, a student at the University of Tennessee at Chattanooga. This research will require me to participate in lesson plans revolving around The Sign of the Beaver by Elizabeth George Speare. Some students will receive instruction with audio/visual aids, and others will receive instruction with literary aids. The purpose of this study is to determine which type of instruction was most effective. I will take a pretest and a posttest during the research period. The scores from each group will then be analyzed to help determine which was most effective. My name and individual scores will be kept anonymous.

Participation in this study is completely voluntary. I may withdraw from the study at any time without penalty. In addition, the scores from this study will have no impact on my class grade.

Student: _____ Date: _____

Teacher: _____ Date: _____

Interdisciplinary Instruction in the Middle School American History Classroom

Patty Benson

EDUC 590

Professor: Dr. Deborah McAllister

Date: April 15, 2004

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-034.

Introduction

I would have to say that the biggest influence in my decision to become a teacher is my mother. She is now retired, but taught elementary school for 36 years. One of my favorite games to play as a child was school and I was always the teacher. Mom has always approached everything in life as a learning opportunity and she passed that love of learning along to me. I believe that my interest in the interdisciplinary learning approach stems from my mother's modeling. She did not just teach a subject and then leave it to teach another. All content areas were interrelated in the classroom. When I look back on my school years, my favorite teachers were those who instinctively used this approach.

Traditional history instruction was done in a memorization style where dates were more important than seeing how events were connected or the cause of greater problems or solutions. As a result, many of my friends were bored, lost or just uninterested. I believe that many of them would have become more interested and enthused about history had other disciplines been used to teach the subject. I decided in high school that I loved government and politics and wanted to pursue a career in that field. My friends, as well as most of my family, thought I was crazy. Because the subject had been presented in unique ways, I was instantly interested and saw how success in one area would naturally relate to another. It made me want to become a problem solver and keep my optimistic nature satisfied.

I will be teaching government, history, and geography and am very passionate about these subjects. I realize, however, that my students may not all be as enthused as I am. Frankly, I am tired of hearing people say that they hated social studies because they hated memorizing dates and places. All I can think is that these people must have had really poor instructors. It is certainly an enigma to me that anyone could dislike any of the social sciences. I want to spark an

interest in students to learn more about social studies and become actively involved in their learning. I believe that interdisciplinary learning helps students see "the big picture." It helps students understand how the various content areas of learning interrelate. It also helps students work through problems of history, government, or geography by relating those areas to something more familiar or with which they are more comfortable. I want to study this teaching technique in order to determine if using the interdisciplinary learning approach will increase student interest and involvement in learning. I believe it will. The use of the interdisciplinary learning approach will also help me as a teacher stay interested in the curricula and keep looking for fresh approaches to the same material.

The interdisciplinary learning approach involves using other content areas, such as art, drama, literature, poetry, and music to teach social studies. Based on available literature, it is apparent that other teachers are using this approach. I have found several articles outlining the need for interdisciplinary learning and examples of how to use it in various circumstances. For example, poetry can be used to teach geography, literature and music to teach history, and art can be incorporated into most curricula. Use of the interdisciplinary approach can also help teachers deal with controversial or painful subjects by allowing students a more comfortable outlet to express thoughts and feelings.

Interdisciplinary instruction is a major factor in current educational reform. Supporters believe that it leads to more involvement and interest on the part of students, as well as increased achievement (Combs & White, 2000). Evidence has shown that active learning makes a positive difference in student learning. As a result of Gardner's theory of multiple intelligences, numerous designs for nurturing these intelligences have arisen. These all point to a need for

integrated learning in an effort to make the very act of learning an experience in which students actively participate (Hollingsworth, Johnson, & Smith, 1998).

I have observed other social studies teachers who use the interdisciplinary learning approach in the classroom and it appears to be successful. One used the book, *Fallen Angels,* by Walter Dean Myers, (1988) to begin a study of the Vietnam War. Another used different music lyrics to teach the Civil Rights movement. I also know an inner-city high school teacher in Ohio who uses students' interest in rap music to have them write rap lyrics to describe various scenes throughout history. The instances of using the interdisciplinary learning approach that I have observed all appear to increase student interest and involvement in classroom learning activities.

The relevance of the project points to an ongoing effort in the social sciences to get more students interested in the content area. I believe that the use of interdisciplinary learning will increase student interest and, as a result, students will want to become involved in classroom learning activities. This study can be used as a guide by other secondary social studies teachers and can even be used as a base for beginning research on this topic in other disciplines. The findings will be useful for other teachers in order to increase student interest and involvement in other aspects of learning.

Problem Statement

If the interdisciplinary approach to instruction is used in the classroom, then student interest in the content will be increased, students will become more involved in their learning, and test scores will increase.

Review of Literature

Interdisciplinary instruction is a major factor in current education reform. Supporters believe that it leads to more involvement and interest on the part of students, as well as increased

achievement (Combs & White, 2000). According to the Merriam Webster Online Dictionary, the word "interdisciplinary" is defined as "involving two or more academic, scientific, or artistic disciplines" (Webster, 2004).

Social studies is, in and of itself, a field of interdisciplinary study. It integrates the disciplines of anthropology, economics, history, government, geography, political science, psychology, and sociology while sometimes adding philosophy and religion. In a K-12 curriculum, for example, social studies is completely integrated in elementary school, begins to gain some single disciplines in middle school, and goes to completely single discipline emphasis in high school (Hartoonian, 1992).

For purposes of this project, a specific content area of American history will be used. In the area of my concern, interdisciplinary will refer to the use of art, music, drama, literature, and poetry to teach an American history unit at the eighth-grade middle school level.

Historically, subjects such as government, history, and geography have had a prominent place in education. The ancient Greeks and Romans studied these subjects in an effort to solve complex problems. I fear that students are now being directed away from these areas because social studies has become a field of memorization and needless facts. Many students will tell you that they are not interested in social studies because they just cannot remember all those dates and do not see the relevance of learning about the past. I believe that by using the interdisciplinary learning approach, interest will again be renewed and students will want to become involved in learning. We know that life is integrated. I believe, that unless we integrate curriculum, educators are only teaching students a portion of the complete story.

I have found a large amount of literature describing various plans for using the interdisciplinary learning approach in the social studies classroom. It appears that I am far from

the first educator to recognize this problem and seek a solution. Most of the available literature provides detailed descriptions for using various forms of interdisciplinary instruction.

Some research indicates that this instructional approach is utilized more by elementary school teachers because they have been trained as generalists and appear to work between disciplines more easily (Combs & White, 2000). Other research contradicts this belief. Schug and Cross indicate that experience has shown elementary teachers have greater difficulty integrating curriculum. They believe that the best integration occurs with secondary teachers who know their subject matter extremely well. These teachers can see how content and skills can be brought together in the most meaningful way (1998). Most agree, however, that, for learning to be valid, teachers must present material that remains true to the discipline. Interdisciplinary instruction probably works best in a team-teaching or collaboration format, but for the purposes of my study, will be used by a single teacher.

Examples of Vehicles for Interdisciplinary Instruction

Poetry has long been used to demonstrate geographic concepts. Celtic monastic schools used educational poems to describe particular concepts (Donaldson, 2001). It has been used to depict scenes from various wars and describe the consequences of war. Poems offer detailed descriptions of one's environment that can rarely be viewed outside the medium.

Poetry can be used as a springboard for researching unknown terms, perceptions, or people. It can also be used to provide a more meaningful understanding of geographic concepts. It offers varied creative possibilities for integration. The goal should be to promote further social studies investigation. This is accomplished by focusing interest, organizing content, and providing appropriate evaluation strategies (Alegria, Labrana, & Wilhelm, 2002).

Researchers have found drama to be an effective integration tool in social studies curricula. Morris describes the use of drama when teaching social studies as a way to help students understand the qualities of the discipline by reenacting particular moments (2000). It allows a platform for discovery of important ideas and issues of both the past and present.

According to Chilcoat, drama can be used as a "tool of analysis, a method of raising issues . . . a forum for discussion, and a way of testing ideas . . ." (2000, p. 276). He describes the use of a flippy play, which is a play with a narrator and, usually, two actors. The actors hold a flip board between them and turn the pages at appropriate times to reveal drawings that serve as a visual tool to supplement the words of the actors. The flippy play is used to work out problems and, most importantly, help students see the relevance of studying historical problems in the context of real life.

Evidence has shown that active learning makes a positive difference in student learning. As a result of Gardner's theory of multiple intelligences, numerous designs for nurturing these intelligences have arisen. These all point to a need for integrated learning in an effort to make the very act of learning an experience in which students actively participate (Hollingsworth, Johnson, & Smith, 1998).

Each example outlined in the research reinforces my hypothesis that the use of the interdisciplinary learning approach will increase student interest and involvement. Social studies is a fascinating field of study and one which students should be encouraged to explore in all aspects. Interdisciplinary learning can help accomplish this goal.

Data Collection and Results

Population

1. The sample of people used as subjects for this project will consist of middle school students in an eighth-grade, American History class. The school is not really classified as either suburban or urban because it has student population from both sectors. The classes are comprised of approximately 55% white and 45% African American students. One class has three non-English speakers.
2. The method of sampling will be opportunity. Three classes have been chosen as the subjects for the study and one class will be chosen as a control group, for comparison purposes. Two of the three classes for subject study are at the average level, with one containing several gifted students. The third study group has approximately seven inclusion students. The control group is at the average performance level.
3. Social studies teachers for either middle school or high school should be interested in this study, if their population is similar to the one on which I report. The teaching techniques used should be transferable to other content areas, but American History is the actual focus of the study.

Measurement

1. The concepts used in this study are the interdisciplinary learning approach and increased student interest or involvement. The interdisciplinary learning approach is defined as the use of materials from other content areas to teach social studies. Examples would be the use of poetry to teach geography, music or literature to teach history, or art to teach government. The goal of this teaching technique is increased student interest which will be shown by increased involvement in class learning activities and higher test scores.
2. Research Grid:

Research Questions	**Data Source**		
	1	2	3
1. Interest in American History?	Pre-test	Post-test	Teacher observation
2. Verbal participation in class activities?			Teacher observation
3. Physical participation in class activities?			Teacher observation

Procedure

1. Design description – I am a student teacher in Hamilton County, Tennessee. I was under the supervision of an on-site classroom teacher, as well as UTC professors and school administrators. I was the one doing the teaching. The test groups were taught American History through an interdisciplinary approach, while the control group was taught American History using the standard curriculum. Both the test and control groups were chosen by opportunity sampling because classes were already grouped by the school. For the test groups, I used music, poetry, geography, and art to teach the U.S. Constitution. Students were given various projects to do using other disciplines, such as art to do a political cartoon or music to write a political advertisement. Students in the control group watched a movie, concerning an appropriate topic for the content area, as a placebo.
2. Procedure description – The study was conducted during spring semester 2004. The first day of student teaching, I met with my supervising teacher, UTC professor, and any other administrators necessary to discuss the intended study. I sent information to the parents of the test and control students and asked for written permission for participation in the

study. I administered a pre-test to secure information about current interest and knowledge levels for the intended American History curriculum. I monitored both verbal and physical participation in class activities throughout the study. Finally, I administered the same test as a post-test to secure information about interest and knowledge levels of the curricula that was taught. These test results were then compared and analyzed.

Results

Out of a test group size of 60 subjects, the average pre-test grade was 70%. After administration of the post-test to the same group, the average grade increased to 76%.

Analysis

I tested the hypothesis that, if the interdisciplinary learning approach was used to teach American History curricula, students would become more interested and involved in the learning, which would result in higher test scores. I used the pre- and post-tests to analyze any increase in test scores between the test and control groups. I also observed student participation in classroom learning activities to gauge any increased interest and involvement.

I was greatly surprised, after interpreting the pre-test (see Appendix A) results, that the students did not know more basic information about the federal government. As a result, I spent much more time than I had anticipated doing drill and practice questioning with the students as I taught the unit. The test subjects had many more opportunities for hands-on activities to do as examples of concepts, rather than just reading the document. The control group received instruction using the standard curriculum.

I then administered the post-test (see Appendix B) and the average grade increased to 76%. Although I would have been more pleased to see an increase of a full 10 percentage points,

I was pleased to see an increase and believe that the results have proven my hypothesis (See Appendix C for results).

Conclusions

Generally, I believe that the use of interdisciplinary instruction made for a more interesting and exciting classroom environment. This allowed students to stretch outside their traditional learning methods and participate more fully in the learning process. The students appeared to really enjoy the interdisciplinary learning activities and responded well in those instances. The pre- and post-test results showed an increase of six percentage points after the instruction occurred for the test group. The National Council for the Social Studies advocates the use of interdisciplinary instruction and many of my professional colleagues agree with this approach.

I believe that many social science teachers would be interested in learning to incorporate the interdisciplinary instruction model in the classroom and would be very supportive of more staff development geared toward that end. I also am learning new technological concepts that will further enable teachers to use this instructional method in the classroom. Besides Internet research, Excel can be used to incorporate geography into a history lesson by using an interactive map for location of points or facts of interest. There are several software programs available to support the use of technology in an interdisciplinary manner in the classroom.

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Appendix A

Pre-Test – U.S. Constitution

Please **circle** the correct answer for each of the following questions.

1. There are _____ branches of U.S. Government.
   a. 9 b. 3 c. 0 d. 6
2. The legislative branch _____.
   a. makes laws b. interprets laws c. carries out laws d. has fun
3. The legislative branch is made up of ____ houses or chambers called Congress.
   a. 4 b. 1 c. 2 d. 6
4. There are two of these elected officials for each state.
   a. Guards b. Presidents c. Representatives d. Senators
5. Each Representative serves a ____ year term.
   a. 2 b. 4 c. 6 d. 1
6. Each Senator serves a ____ year term.
   a. 2 b. 4 c. 6 d. 1
7. In order to run for the U.S. Senate, a person must be _____ years of age.
   a. 15 b. 40 c. 30 d. 25
8. In order to run for the U.S. House of Representatives, a person must be _____ years of age.
   a. 15 b. 40 c. 30 d. 25
9. The executive branch of government _____.
   a. makes laws b. interprets laws c. carries out laws d. has fun
10. The _____ is the Chief Executive.
    a. Senator b. Representative c. President d. Justice
11. The President must be a _____ citizen of the United States.
    a. temporary b. naturally born c. illegal d. part-time
12. You must be at least _____ years of age to run for the Presidency.
    a. 35 b. 40 c. 30 d. 25
13. The current Secretary of State is _____.
    a. retired b. Dick Cheney c. Condoleeza Rice d. Colin Powell
14. We now have a Presidential term limit of ____ terms.
    a. 9 b. 6 c. 1 d. 2
15. The judicial branch of government _____.
    a. makes laws b. interprets laws c. carries out laws d. has fun
16. There are currently _____ Supreme Court justices.
    a. 5 b. 12 c. 2 d. 9
17. A Supreme Court justice may serve for _____.
    a. life b. 2 years c. 10 years d. 1 year
18. The current U.S. President is _____.
    a. Jimmy Carter b. Herbert Hoover c. George W. Bush d. Al Gore
19. One of Tennessee's current U.S. Senators is _____.
    a. Dick Cheney b. Zach Wamp c. William Rehnquist d. Bill Frist

20. In order to vote, you must be ____ years of age.
    a. 21 b. 30 c. 18 d. 40
21. This term means two houses or chambers of Congress.
    a. bicycle b. bituminous c. bicameral d. bifocal
22. This means the process by which an amendment is approved.
    a. ratification b. unanimous c. majority d. select
23. The first ten amendments to the Constitution are called the _____.
    a. Bill of Debts b. Bill of Rights c. Bill of Calling d. taxes
24. This man wrote the Bill of Rights.
    a. John Adams b. James Madison c. George Washington d. Gerald Ford
25. There are currently this number of amendments.
    a. 500 b. 69 c. 27 d. 100

Appendix B

Post-Test – U.S. Constitution

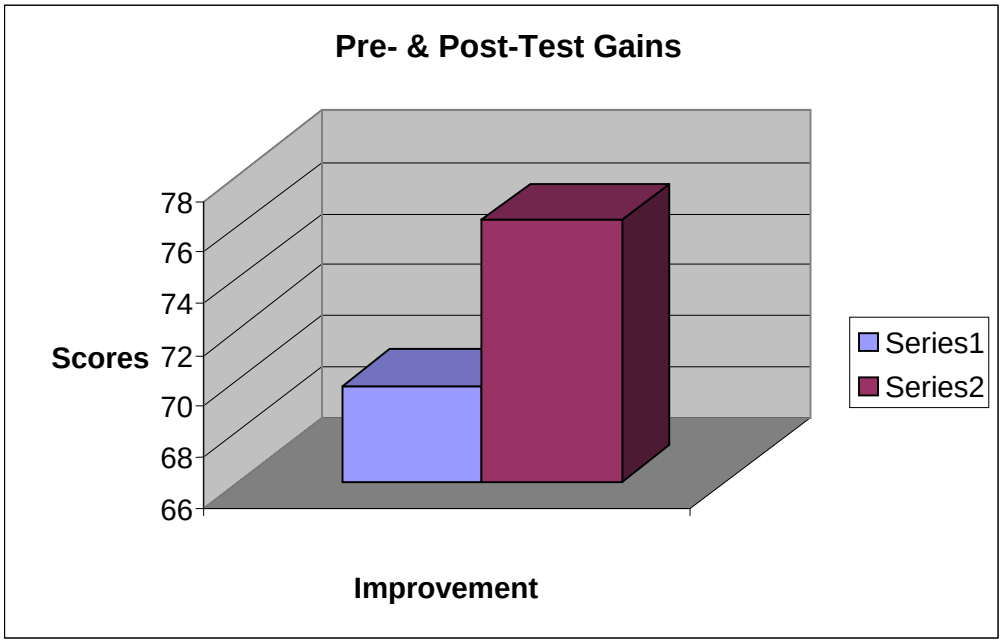
Please **circle** the correct answer for each of the following questions.

1. There are _____ branches of U.S. Government.
   a. 9 b. 3 c. 0 d. 6
2. The legislative branch _____.
   a. makes laws b. interprets laws c. carries out laws d. has fun
3. The legislative branch is made up of ____ houses or chambers called Congress.
   a. 4 b. 1 c. 2 d. 6
4. There are two of these elected officials for each state.
   a. Guards b. Presidents c. Representatives d. Senators
5. Each Representative serves a ____ year term.
   a. 2 b. 4 c. 6 d. 1
6. Each Senator serves a ____ year term.
   a. 2 b. 4 c. 6 d. 1
7. In order to run for the U.S. Senate, a person must be _____ years of age.
   a. 15 b. 40 c. 30 d. 25
8. In order to run for the U.S. House of Representatives, a person must be _____ years of age.
   a. 15 b. 40 c. 30 d. 25
9. The executive branch of government _____.
   a. makes laws b. interprets laws c. carries out laws d. has fun
10. The _____ is the Chief Executive.
    a. Senator b. Representative c. President d. Justice
11. The President must be a _____ citizen of the United States.
    a. temporary b. naturally born c. illegal d. part-time
12. You must be at least _____ years of age to run for the Presidency.
    a. 35 b. 40 c. 30 d. 25
13. The current Secretary of State is _____.
    a. retired b. Dick Cheney c. Condoleeza Rice d. Colin Powell
14. We now have a Presidential term limit of ____ terms.
    a. 9 b. 6 c. 1 d. 2
15. The judicial branch of government _____.
    a. makes laws b. interprets laws c. carries out laws d. has fun
16. There are currently _____ Supreme Court justices.
    a. 5 b. 12 c. 2 d. 9
17. A Supreme Court justice may serve for _____.
    a. life b. 2 years c. 10 years d. 1 year
18. The current U.S. President is _____.
    a. Jimmy Carter b. Herbert Hoover c. George W. Bush d. Al Gore
19. One of Tennessee's current U.S. Senators is _____.
    a. Dick Cheney b. Zach Wamp c. William Rehnquist d. Bill Frist

20. In order to vote, you must be ____ years of age.
    a. 21 b. 30 c. 18 d. 40
21. This term means two houses or chambers of Congress.
    a. bicycle b. bituminous c. bicameral d. bifocal
22. This means the process by which an amendment is approved.
    a. ratification b. unanimous c. majority d. select
23. The first ten amendments to the Constitution are called the _____.
    a. Bill of Debts b. Bill of Rights c. Bill of Calling d. taxes
24. This man wrote the Bill of Rights.
    a. John Adams b. James Madison c. George Washington d. Gerald Ford
25. There are currently this number of amendments.
    a. 500 b. 69 c. 27 d. 100

Appendix C

Testing Results



Economic Evaluation:

An Evaluation of a Pre-test and Post-test for an Economic Unit

Hoan Bomar
EDUC 590
Dr. Deborah McAllister

April 16, 2004

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-079.

Introduction

The main objective of this study is to determine the amount of knowledge students retain after studying a distinct unit on economics in a history class. The students that will participate in this project will be eighth-grade students studying American History. Although the students have not had economics as a separate course, it has been integrated into their history lessons throughout the school year. For example, the students studied the Triangular Trade as an event in American history. Although lessons on the Triangular Trade included the effects of this trade on America's economy, the main purpose was to depict this trade as an historical event. For this investigation, economics will be the main focus with the integration of historical events to support ideas in economics. The students will take a pre-test prior to instruction and a post-test after instruction. The results of the post-test can help the teacher reevaluate his/her knowledge of economics and how he/she can become more comfortable when teaching economics in a history classroom.

Review of Literature

Economics is a discipline that is often taught integrated with social studies. When teaching economics, two issues can arise. First, teachers are inadequately prepared to teach economics. Second, when classroom teachers include economics in the curriculum, the focus is often on minor economic concepts and vocabulary while leaving out fundamental principles in economics.

Traditionally, teachers take very few economics courses as part of their undergraduate education. For example, Walstad and Watts found, at the elementary level, that over half of the teachers had no courses in economics and 25 percent had only one course (1985). According to Becker and Hallows, the number of economics courses a teacher has taken has a significant

impact on teacher knowledge, and consequently, on students' performance (1993). As a result of inadequate preparation in economics, teachers are intimidated by the subject matter and feel uncomfortable teaching that which they themselves do not understand (Walstad & Watts, 1985).

A second problem in teaching economics in a history course is that teachers often focus on minor economic concepts and vocabulary. Fundamental principles in economics are often ignored. For example, teachers distinguish between needs and wants, but fail to teach the fundamental principle that there are limited resources available to satisfy wants, therefore, choices must be made. Furthermore, teachers may use games and simulations to introduce economic concepts without significant instruction and follow-up discussion to explain the economic concepts. This would result in very little fundamental economic understanding on the part of the students (Schug and Walstad, 1991).

Numerous groups and individuals, such as James Tobin, voice the need for economic competency among students. In a Wall Street Journal article, he stated:

> High school graduates will be making economic choices all their lives, as breadwinners and consumers, as citizens and voters. A wide range of people will bombard them with economic information and misinformation for their entire lives. They will need some capacity for critical judgment. (Tobin, 1986, p. 38)

The *Voluntary National Content Standards in Economics* established the economic knowledge and skills students should have upon leaving high school. Without this knowledge and these skills, students would be considered disadvantaged (National Council on Economic Education, 1997).

With the emphasis placed on economic education, teachers must overcome the problems of teaching economics in a history class. Teachers must evaluate their lessons and adjust to the

needs of the students. The pre- and post-test technique will assist them in evaluating how much knowledge students have gained.

Data Collection and Results

Prior to teaching the unit on economics, the 42 students were given a pre-test. The pre-test covered different economic perspectives during certain periods of American history. The pre-test consisted of 25 multiple-choice questions. The same 42 students were given the same test as a post-test after classroom instruction. Figure 1 shows the pre- and post-test results as well as each student's improvement. Figure 2 shows a line graph displaying the same information. Also included is the pre- and post-test and the answer key (see Appendix A).

The mean score for students on the pre-test was 46.95. This shows that the students' prior knowledge was low. Only two students passed the pre-test. Both students score 76 points. The teacher should begin the unit by introducing basic terms and concepts to the students. The mean score for students in the post-test was 80.50. Thirty-six students passed the post-test. This shows a mean improvement of 33.55.

Student	Pre-test	Post-test	Improvement
1	24	60	36
2	52	56	4
3	36	40	4
4	40	72	32
5	64	92	28
6	76	96	20
7	44	96	52
8	48	84	36
9	32	76	44
10	60	100	40
11	56	96	40
12	64	100	36
13	28	76	48
14	48	84	36
15	52	88	36
16	40	84	44

17	52	72	20
18	40	88	48
19	44	72	28
20	40	40	0
21	64	96	32
22	56	88	32
23	20	88	68
24	76	96	20
25	60	100	40
26	64	84	20
27	52	80	28
28	34	68	34
29	48	72	24
30	36	84	48
31	20	72	52
32	68	76	8
33	28	100	72
34	68	72	4
35	20	80	60
36	60	88	28
37	44	72	28
38	34	80	46
39	64	76	12
40	44	80	36
41	36	77	41
42	36	80	44
Average	46.95	80.50	33.55

Figure 1. Pre-test and post-test results as a data table.

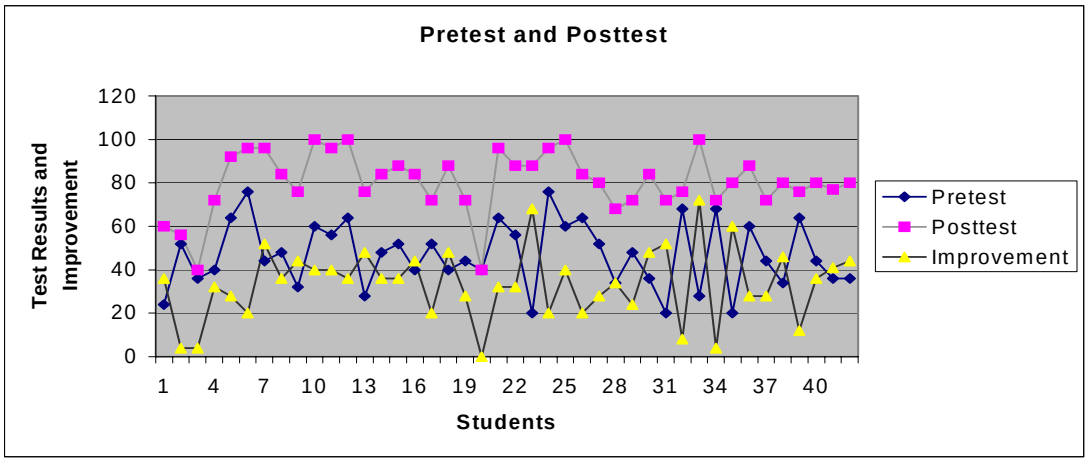


Figure 2. Pre-test and post-test results as a chart.

Conclusions and Recommendations

An evaluation of the results of the pre- and post-test showed that students made improvements after instruction. Although the students scored higher on the post-test, there is still room for improvement. This conclusion supports the findings from the review of literature discussed above. Teachers must become better prepared to teach economics in a more effective way.

One recommendation is for teachers to gain a deeper understanding of economics. Teachers can gain more knowledge about economics by taking courses offered by the National Council on Economic Education's (NCEE) network. This network includes over 250 centers for economic education located on college campuses throughout the United States. Each offers a variety of economic courses for teachers (National Council on Economic Education, 1997).

A deeper understanding of subject matter provides teachers with the background for higher-order thinking and questioning skills. According to Darling-Hammond, teachers who promote higher-order thinking will help students learn to construct knowledge which would help them develop a better understanding of content material (Darling-Hammond, 1996).

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Walstad, W., & Watts, M. (1985). Teaching economics in the schools: A review of the survey findings. *Journal of Economic Education, 16*(5), 135-146.

Other Literature Read

Tobin, J. (1986). Economic literacy isn't marginal investment. *Wall Street Journal*, 9.

Appendix A

Instruments and Answer Key

Name:_____ Period: _____
Date:_____

Economic Pre-test

Multiple Choice (4 points each)

1.America's natural resources include all of the following EXCEPT
a. timber b. cattle c. tobacco d. pumpkins

2.Goods bought on _____ will be paid for at a later time.
a. credit b. debt c. cash d. checks

3.The main economic activity for the thirteen colonies was
a. fishing b. service c. farming d. ship building

4.New England's economy was based on all the following EXCEPT
a. farming b. ship building c. large plantations d. fishing

5.All of the following crops were grown on large-scale plantations in the Southern Colonies EXCEPT
a. tobacco b. grain c. rice d. indigo

6.A tax on imported goods is a
a. excise tax b. sales tax c. tariff d. property tax

7.A tax paid on purchases
a. excise tax b. sales tax c. tariff d. property tax

8.A market in which the control over the supply of a product is in the hands of a small number of producers
a. free competition b. oligopoly c. monopoly d. traditional

9.A market in which there are many buyers and only one seller
a. free competition b. oligopoly c. monopoly d. traditional

10.An economy where farming is done for a profit
a. subsistence economy b. industrial economy c. commercial economy d. survival economy

11.People who supply goods and deliver services
a. producers b. competitors c. consumers d. monopolists

12.People who use goods and services
a. producers b. competitors c. consumers d. monopolists

13.A theory that explained how colonies increased the economic power of their parent countries
a. capitalism b. competition c. mercantilism d. socialism

14.The imbalance between our wants and needs and resources
a. choices b. scarcity c. demand d. supply

15._____ means that different countries depend on trade with each other to supply their wants.
a. scarcity b. demand c. supply d. interdependence

16.Factors that influences consumer decisions include all of the following EXCEPT
a. price and purpose b. quality and brand name c. competition and demand d. advertising and appearance

17._____ banks are the Federal Reserve banking network
a. commercial b. central c. intermediated. local

18.A tax paid on items such as gasoline, tobacco, and alcohol
a. excise tax b. sales tax c. tariff d. property tax

19.Demand, competition, and available resources are factors that influences _____ decisions.
a. consumer b. banking c. producer d. shopping

20.The countries that provide the most money for the global economy includes
a. United States, Europe, and Japan b. India, Brazilc. Vietnam, China d. Mexico, Iran

21.If the supply increases and demand stays the same, the price will
a. increase b. decrease c. remains the same

22.If the supply decreases and demand stays the same, the price will
a. increase b. decrease c. remains the same

23._____ are things that we have and they are limited
a. wants b. needs c. resources d. scarcity

24._____ banks provide savings accounts, checking accounts, and loans to people and businesses.
a. commercial b. central c. intermediated. local

25.Central Banks do all of the following EXCEPT

a. regulate commercial banks b. loan money to commercial banks c. control the money supply

d. provide safe-deposit boxes

Name:_____ Period: _____

Date:_____

Economic Post-test

Multiple Choice (4 points each)

1.America's natural resources include all of the following EXCEPT
a. timber b. cattle c. tobacco d. pumpkins

2.Goods bought on _____ will be paid for at a later time.
a. credit b. debt c. cash d. checks

3.The main economic activity for the thirteen colonies was
a. fishing b. service c. farming d. ship building

4.New England's economy was based on all the following EXCEPT
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a. commercial b. central c. intermediated. local

25.Central Banks do all of the following EXCEPT
a. regulate commercial banks b. loan money to commercial banks c. control the money supply
d. provide safe-deposit boxes

Answer Key for Economic Pre- and Post-test

1.B
2.A
3.C
4.C
5.B
6.C
7.B
8.B
9.C
10.C
11.A
12.C
13.C
14.B
15.D
16.C
17.B
18.A
19.C
20.A
21.B
22.A
23.C
24.A
25.D

Studio Art and Self-Regulatory Skills:

Is There a Connection?

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Educ 590

Spring 2004

Studio Art and Self-Regulatory Skills:

Is There a Connection?

Introduction

All my adult life, I've had to defend the time, effort, and energy spent in art-creating activities. Art in the education system is also having to constantly take a defensive stand. The fine arts are always the first programs to be cut when there is a budget shortfall. I am aware that art enhances the quality of my life and that the art education I have experienced has developed my cognitive abilities. Art education enabled me to develop creative thinking skills, problem-solving skills, and self-regulatory behavior that I would not have learned in the other disciplines. Nick Decosimo, a local arts advocate, eloquently describes the importance of arts education:

> Most of us when we're working don't use calculus and physics we learned in school that much. But we do use critical and creative thinking skills a lot.
>
> Those skills are best developed through art, creative writing, all those processes of creative effort that tend to be given short shrift in a lot of educational environments. But those are the ones that really get used a lot. People who excel in those are frequently the people who do best in all endeavors. ("Annual Campaign," 2002, p. 1)

It is commonly accepted that students use many different types of intelligence to learn (Oddleifson, 1994; Stinespring, 1991). Art education actively involves a variety of these intelligences and uses these to comprehensively engage the student in the learning experience. Every student needs exposure to studio art and art appreciation in order to help them develop the critical thinking skills they need for higher education and for their careers.

John Stinespring refers to the College Entrance Examination Board's report of 1983 that states, "preparation in the arts is valuable for students entering college no matter what they

choose for a major. The advantages include engaging the imagination, fostering flexible ways of thinking, developing disciplined effort, and building self-confidence" (Stinespring, 1991, p. 25). Students are handicapped by the lack of art education because art education engenders the development of cognitive skills such as

problem-solving; self-regulation; and creative, critical, and flexible thinking. These skills are necessary in today's rapidly changing job market. These skills are learned in many of the disciplines taught in schools, but since people have different types of intelligence and different types of learning styles, art is a subject that reaches some of the students whose styles of learning are not utilized proficiently in the more verbal and written styles that often dominate academic classrooms.

Articles defending and promoting the role of art in the complete education of every child have been written and published for years without making an impact on the inclusion of art education in the curriculum of every school system, K-12. These articles eloquently enumerate the advantages of instruction on the arts. They state that art education develops a student's cognitive abilities, and thus enhances the student's performance in the other academic areas. These studies discuss cognition and the learning skills that the arts develop without specifically tying these cognitive abilities to studio art activities. There are a lack of empirical studies that support the statements. There are many reasons for this, the most prominent being that art is a field characterized by ambiguous vocabulary, abstract concepts, and the emotions of individuals. These items are hard to measure concretely. This study poses the question: Will a studio art class given to sixth-grade students improve their self-regulatory behavior?

Baum, Owen, and Oreck describe self-regulated students as students that are aware of their learning processes and make decisions about these processes (1997). They refer to

Bandura's study of 1986 in their division of self-regulation into four events: self-observation, standard setting, self-reaction, and self-efficacy. John Stinespring refers to a study by Cocking, published in 1988, that separates metacognition, which he equates with self-regulation, into a five step process: defining and setting the boundaries of a task, analyzing what is needed for the task, making a plan of execution, setting the standards for realizing when the project is complete, and evaluating the quality of the result (1991).

This study will focus on an art class composed of sixth-grade students who are taking art for the first time. Since art is not offered in most elementary schools, the students have not had art as part of their public education experience. These students may only take one art class in their middle school years. It is possible that not all the students of this middle school will have the opportunity to take art. The

other group studied will be a language arts class whose members have not had the opportunity to take art yet. The results of the scores of the students of the two classes will be compared. This study is critical because the of the importance of art education.

This population is similar to, and representative of, other inner-city populations in any area of the United States where art is not introduced into the curriculum as a separate class until the middle school. It is also similar to, and representative of, any school district that trims art from the curriculum because of budget cuts. This population is in a Title I school where the researcher has observed that the motivation to complete work is low.

Self-regulatory behavior will be measured. Self-regulation is described by five behaviors: (a) defining and setting the boundaries of a task, (b) analyzing what is needed for the task, (c) making a plan of execution, (d) setting the standards for realizing when the task is done, and (e) evaluating the quality of the result (Stinespring, 1991). This will be measured by a written

questionnaire given to students in both groups. This same questionnaire will be given by the researcher at two different times, similar to the execution of a pre- and post-test (see Appendix A).

This questionnaire would be given to my middle school daughter or other available middle-school-aged students, regardless of art experience, to determine whether the questions were understood by this age group. The researcher is aware that this questionnaire might be incomplete the first time it is given. A limitation to the written questionnaire would be the students' varied abilities to express ideas in writing. The questionnaire will take approximately 8 to 10 minutes to administer. Questionnaires would be given at two different times in a 9-week period.

This questionnaire would be graded on a numerical scale. There are 20 questions and each question would have a value of 5 points. A panel of 3 experts, a general educator, an art educator, and the researcher, will grade the questionnaires. When grading the questionnaires, they would use the written questionnaire and grade it on a scale of 0 to 5 for each question to determine the completeness of the answer. If a question was very incomplete it would be given a value of 0 to 2, 3 for halfway complete, and 4 and 5 for very complete answers. Since there are 20 questions, with a value of 0 to 5 each, there are100 possible points for a perfect score.

To implement this study, the researcher would have to get permission of The University of Tennessee's Institutional Review Board, the middle school principal, the studio art and language arts teachers, and the students (and parents) in each group.

Literature Review

Art education is not recognized for the benefits it contributes to a student's complete education. This is evident particularly in school systems where it is viewed as an elective or

exploratory course instead of being included in the core curriculum that is required of every student. Literature has been written for many years defending and promoting art education, but budget cuts and the emphasis on other additions to the curriculum, such as character education classes, have made the advocacy of art education more necessary than ever before. The literature in this review successfully explains the cognitive growth that occurs in art education, and persuasively makes the case that art education is necessary for the higher-level thinking skills needed for optimum intellectual development, which directly translate into an individual's job marketability and his or her contribution to society. It is also asserted that the cognitive skills learned in art enhances an individual's quality of life. These articles do not specifically tie the development of these cognitive abilities to art-making activities. In order for art education to be defended adequately, more empirical research needs to be done. Once it is done, then it needs to be reported to educators, administrators, and the general public. In the synthesis of these articles, the reason for a negative view of art education will be discussed, as well as a description of cognitive development and art's essential role in the complete cognitive development of a child.

Art education is viewed as frivolous. Several authors trace this belittling attitude back to the Greek philosophic tradition of Plato, Aristotle, and the Stoics (Eisner, 1980; Kay, 1990; Ives & Pond, 1980; Ewens, 1989; Feldman & Woods, 1981; Oddleifson, 1994). The Greek philosophic tradition separates the intellect from emotion. They state that the intellect and abstract thinking are synonymous with truth, because they deal with objective facts that are concrete and measurable. Emotions are ambiguous. They are derived from the ephemeral, decaying world. This has developed into a value system that is so permeated in our western

culture that it has become a background for our thought and a basis for our education system. This view is commonly unchallenged by the majority of our society.

This has become a polarized situation with science on one side and art on the other. Science is the essence of objectivity. It is characterized by generalization and measurability, and has become equated with truth. Art, which is subjective, ambiguous, and characterized by individuality, is thought of in negative connotations. These characteristics of art are not given equal value as the truths of science. Part of this skewed system is a result of the inadequate vocabulary used to describe art, which in turn is another result of the Greek tradition (Ewens, 1989).

Scientific and artistic activities both arise from a state of wonder or curiosity derived from the senses. From that point on, there are an array of differences. The scientist, with a predetermined purpose in mind, chooses certain subjects to study, and often takes them out of context and puts them in a controlled environment. The scientist subordinates the individual subject in order to make his conclusions a generalization that can be applied in a larger context (Ewens, 1989). Scientific experiments are characterized by qualities that can be numerically numbered. The numerical quality of results is also considered as truth. The individual scientist is unimportant except as he or she is a mere recorder of the details of the experiment. Self-transcendence is also another characteristic of science because scientists think outside of themselves (Ewens, 1989).

Artists are also self-transcendent because, in the process of production, artists step outside of themselves and evaluate the methods and success of the artwork. Unlike science, art celebrates the individual. Also unlike science, subjects are normally not chosen because they are an anonymous representation of a larger group. Context and emotions are also extremely

important to an artwork and art concepts can rarely be measured, graphed, or become a correlation coefficient. Art also frequently comments on social issues and is often a documentary of its time (Feldman & Woods, 1981).

An example of this value system that science is objective, and therefore good, and art is subjective, and therefore unreliable, is the time allotted to art in school systems (Eisner, 1980; Kay, 1990). Art is often taught in the afternoon when students are tired, or as a reward from the more taxing core curriculum (Mittler & Stinespring, 1991). In secondary schools, it is often offered as an elective. Because the administrators do not give art equal time, the students infer that it is less needed to succeed.

Another reason art is viewed negatively is that the public thinks it is just for the talented and that it doesn't contribute financially to society (Baum, Owen, & Oreck, 1997). These two attitudes are narrow definitions to define success, and they do not acknowledge the cognitive contributions that art education makes. In the current economic climate, the critical thinking, flexibility, and problem-solving skills that develop from art education are necessary for all careers. Ours is an information age where computers hold vast stores of facts making memorization no longer as necessary as it once was. Analyzing, ordering, synthesizing, and creative thinking skills are necessary for success (Stinespring, 1991).

Cognition, or the process of acquiring knowledge, has many attributes or qualities. Stinespring (1991) gives a list of 35 cognitive operations. In understanding how people learn, we have to understand the way they use intelligence. Howard Gardner divides intelligence into several categories (Oddleifson, 1994; Stinespring, 1991): verbal, logical/mathematical, visual/spatial, musical, kinesthetic, interpersonal, and intrapersonal. Schools primarily develop and measure the verbal and logical intelligences. Children learn in a variety of ways, and to

emphasize two is to insufficiently educate many children (Eisner, 1980; Oddleifson, 1994). A predominant style of teaching relies on lecture, and question and answer methods (Stinespring & Kennedy, 1988). That method reaches a limited number of students.

Learning by doing, or kinetic learning, is an effective method applied in art education. Different media utilize different cognitive abilities (Ives & Pond, 1980). Visual learning is another effective method. Albert Einstein described visualizing his thinking methods. Early reading instruction involves the use of visual concepts (Feldman & Woods, 1981). Reading is enhanced by art education in many ways, one of them being the understanding of meaning and applying the meaning derived from literature to life. Feldman and Woods define reading as "the perception or creation of meaning in experience" (p. 76). Ewens discusses John MacMurray's ideas that art gives value and meaning to life. This recognition of value is unimportant to science because it is immersed in the senses, but this concept of value is essential in the total education of a child (Stinespring & Kennedy, 1988). They have to function in reality where objectivity is not supreme.

Another cognitive benefit is flexibility and risk-taking. These are especially needed in today's job market where individuals change jobs frequently (Perrin, 1994). These are both used in the art-making process, prompted and fostered by the art instructor by individualized questions and periodic feedback (Baum, Owen, & Oreck, 1997; Fineberg, 1994).

An empirical example of instructional question and feedback was discussed in Fineberg's "Critical and Creative Thinking and Making Art." She mentioned the school, the years studied, and the number of teaching artists, but the only empirical data she presented was describing briefly the methods of two teachers.

Good problem-solving skills are another outcome of art education (Stinespring, 1991; Bailin, 1994). Students have to make a variety of choices during an art activity. They need to utilize knowledge of their materials, themselves, and their society, past and present.

Self-regulation or metacognition (Stinespring, 1991; McCoubrey, 1994; Baum, Owen, & Oreck, 1997) is also an important result of art education. This skill is transferable and beneficial to learning methods in the other disciplines. Self-regulatory behaviors include paying attention, problem solving, self-initiation, persevering, cooperating, and goal-setting. These behaviors are modeled by the instructor. The encouragement and feedback given by the instructor before, during, and after the art production facilitates the development of these abilities (Baum, Owen, & Oreck, 1997).

The articles in this review are all clearly related to the topic of cognitive development in art education. They range from 1980 - 2001, which shows that the message of the necessity of art education has not gotten through to the public. As discussed previously, the Greek tradition of thought believes that objectivity is concrete and unchangeable, and, therefore, truth, and dismisses the value of subjectivity because it is ambiguous and abstract, and, therefore, more unreliable. Because subjectivity is an essential element of art and art education, this philosophy has negative ramifications for art education and needs to be combated. Students in any educational system deserve the complete cognitive development that art education, with its inclusion of the use of the multiple intelligences, critical thinking skills, and metacognition, can give them.

While these articles were excellent and persuasive theoretical arguments for the development of cognitive abilities in art education, they did not include any empirical studies.

They did refer to many psychologists without making clear that these psychologists related their work on cognition specifically to art.

More research needs to be done that ties these cognitive abilities to studio art and art appreciation. Once this research is done, the results need to be broadcast to the public. Parents need to know what their children can gain from art education. Students need to know that art can help them in higher education and in life experiences.

Data Collection and Results

The sixth-grade students of a language arts class and a studio art class in an inner-city environment were given the same written questionnaire at the beginning and the end of a month. The study was originally designed to give the questionnaire at the beginning and end of a 9-week grading period, because art classes rotate students every 9 weeks. The researcher also felt that it was important to give the questionnaire after the students had completed their first art project, and after they had completed their last art project. If the questionnaire was given in such a manner, it would measure the change in a student's self-regulatory skills after their first introduction to art education, which is critical because the students tested have not previously experienced art education. Because the study was delayed by the university's Institutional Review Board approval process, the questionnaire was given with only a 1-month interval between the first and second questionnaires.

In both classes, the researcher read the questions to the students. If there was some confusion

about a question, the researcher rephrased the question. The students answered the questions without any help or influence from the researcher. Many of the students did not listen to the researcher's reading or rephrasing of the questions, and completed the questionnaire at their own

pace. The students in each class were instructed to think about a specific project they had recently completed when answering the questions. For the first questionnaire, the art students thought about a collage, and the language arts students thought about the Tennessee State Writing Assessment. For the second questionnaire, the art students thought about a Pointillism project, and the language arts students thought about a Black History project. Because of absenteeism or a student's refusal to attempt the questionnaire, there were eight art students and nine language art students that participated in the study.

A general educator, an art educator, and the researcher independently scored the questionnaires. As mentioned previously, the questionnaire had 20 questions. Each question was worth a total of 5 points, which equaled 100 possible points. Each question was scored on the completeness of the answer. A score of 0, 1, or 2 was given for blank or minimally complete answers. A score of 3 was given for an answer that gave specific information, but could have been more detailed. A score of 4 or 5 was given for an answer that was specific and detailed, in which the student was able convey ideas and those ideas were related to the intention of the question.

The data from all the scorers showed that the self-regulatory skills of a majority of the students of both classes improved (see Table B1, Appendix B). The mean number of students who improved in the studio art class was 5, and the mean number for students in the language arts class who improved was 8. This was derived from adding the number of improved students of the art class from the results of each scorer, and dividing by the number of scorers. The same was done with the numbers of improved students in the language arts class. Since only 8 art students participated, and only 9 in the language arts class, that is a significant number of students that improved.

The scores of the students who improved their self-regulatory skills are shown in Table B2 (see Appendix B). The mean number of points that a student improved are shown by class and by scorer. The mean number of points that an art student improved is 9.2. That is derived from adding all the number of points of improvement from each scorer's results, and dividing by 3, the number of people who scored the tests. The mean number of points that a language arts student improved is 15.3. The results of this study show that sixth-grade students in both disciplines improved their self-regulatory skills over a 1-month period, but the results do not indicate why the students improved, nor why a mean of three more students in the language arts class improved than in the studio art class.

There are several factors that could have influenced the study. A student's natural maturation could be a factor in the improvement of their self-regulatory skills, but within the small time frame of 1 month, that was probably not a significantly influential factor. Another reason the scores may have improved is that the student was more familiar with the questionnaire the second time they took it.

The quality of teaching during the month could have affected the students' scores. The art class had a student teacher for half of the month, and the teacher of the language arts class, who was new at the beginning of the 9-week period, quit during the month in which the students were tested. The time of day and mood of the student could also affect the scores. Both classes took the questionnaire during their regular class time. The language arts students took the questionnaire at 7:30 a.m., and the art students took the questionnaire at 1:30 p.m. The students of the early class were visibly tired, and the students of the afternoon class were ready to be out of school for the day.

The questionnaire was also given to my children. The score of my 12-year-old, an "A" student from a rural public school, was consistent with the score of the inner-city language arts students. From this scant information, it could be surmised that self-regulatory skills might be a result of a student's maturity, until one looked at the score of my younger daughter's questionnaire. The score of my 9 ½-year-old, who is an "A/B" student from a rural public school, was 30 points above her sister and the inner-city language arts and art students. Both girls were given the same verbal instructions, which indicates that more research is needed.

Conclusions and Recommendations

The National Art Education Association and the Tennessee Arts Commission have statistical support that fine arts education is beneficial to students. Art education improves a student's academic achievement, problem-solving and team-building skills, and promotes greater retention ability, increased communication skills, and higher levels of self-confidence (K. Leavitt, Program Coordinator for Arts in Education, Tennessee Arts Commission, personal communication, April 7, 2004). There is not a consensus on the specific issue of self-regulatory skills. As mentioned before, more research is needed.

A teacher development program for all content areas that focused on instructing teachers to coach students in the development of their self-regulatory skills would be beneficial. The current use of graphic organizers is a step in the direction of encouraging a student's self-regulation, but the importance of the function of a teacher as a mentor and facilitator to stimulate these skills is key. In this teacher development program, the teachers could be coached to use specific questions with their students. For instance, in the context of language arts, the teacher could address the student, "You have completed your opening paragraph. What are you going to do next? What if you pick one of your points in your opening paragraph, and write a paragraph

with details to support that point?" In the context of art, the teacher could say, "You have sketched your painting. What colors do you want to use? Do these colors convey the mood you want to express in your painting?"

Most of the grant money that is available is for art production or exhibits, and not specifically for research. It would be possible to try for a grant as a *special project* from the Tennessee Arts Commission, or under the category *learning in the arts for children and youth* from the National Education Association. Our local Lyndhurst Foundation has given grants for art production, and to art institutes, but not research projects. It is possible that both Lyndhurst and Allied Arts of Chattanooga could fund art education research, if approached.

For this research project, technology could have been used if the students had access to the computer lab to take the questionnaire, and submit it online. Software could be developed to coach students in the development of their self-regulatory skills.

In conclusion, this study reveals that the self-regulatory skills of sixth-grade students improved over a 1-month period for both language arts and studio art students. The language arts students improved more than the studio art students. Further study that can isolate, describe, and measure the factors that influence self-regulatory skills and then apply that knowledge to research in the art education field is needed.

The value of art education needs to be recognized whether it can be empirically measured or not. Art education should be "justified in terms of what the arts can teach that no other subject can teach" (Winner & Hetland, 2001, p. 8).

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Other Literature Read

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Appendix A

Questionnaire

1. What is your art project or writing assignment?
2. What do you want it to express?
3. What will it look like when you're done?
4. What do you want other people to think about it?
5. What tools do you need to make the project or writing assignment?
6. What colors (ideas or events) are important?
7. How will you arrange or organize your project?
8. How will you display your project when finished?
9. How long will it take you?
10. What will you do first?
11. What will you do when you are halfway finished?
12. What will you do last?
13. How will you know when you are done?
14. Is it because your paper is completely covered, or your sculpture is big enough, or your paper has the required number of pages?
15. Is there a certain feeling achieved or information given?
16. Do you feel the subject matter is adequately dealt with?
17. Does the project do what you said in question #2?
18. Do you think other people understand what you want to express with the project?
19. Did you enjoy it?
20. Are you happy with the finished piece?

Appendix B

Tables

Table B1

Quantitative Improvement in Self-Regulatory Skills

Scorer	Class	Number of Students Improved
Researcher	Studio Art	5
	Language Arts	7
Art Educator	Studio Art	6
	Language Arts	8
General Educator	Studio Art	4
	Language Arts	8

Table B2

Mean Improvement in Self-Regulatory Skills

Scorer	Class	Mean Improvement
Researcher	Studio Art	11.2
	Language Arts	16.3
Art Educator	Studio Art	8.5
	Language Arts	11.9
General Educator	Studio Art	18
	Language Arts	17.6

Using Controversial Topic Discussion to Teach History

Brinn Dalton
Education 590

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-060.

Introduction to the Problem

The problem I'm trying to research and alleviate from my classroom is the general lack of interest in social studies classes. This lack of interest creates a lack of participation and jeopardizes my personal goals and the goals of the entire educational system. One of the goals listed by the National Council for the Social Studies is to, "help young people develop the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world" (Foster & Padgett, 1999, p. 358). How can educators expect students to make informed and reasoned decisions when classes that are supposed to teach societal participation and ethical behavior are viewed as boring and as waste of time by students?

I have read, seen, and dealt with the negative attitudes geared toward social studies. I suffered through boring classes in political science, history, and geography, myself, having to remember trivial facts just well enough to pass a memorization-based test. "Numerous studies of history teaching in U.S. schools reveal classroom instruction is concerned primarily with having students memorize unrelated facts for short-term multiple choice tests…the net result is that students frequently find the subject irrelevant, tedious, and boring" (Foster & Padgett, 1999, p. 357).

I have concluded that my personal lack of interest, during most of my secondary social studies courses, came from inept instruction using traditional techniques and material. I have been through many "answer the questions at the end of the chapter" routines, and I realize that I gained very little from this form of instruction. The same material I found boring and tedious was the subject matter that was supposed to teach me about cultural understanding, political activism, and other important social characteristics. I can also remember many students similar

to myself who simply went through the motions and shrugged off any importance in the material. We were also the same students who shrugged off registering to vote, reading the newspaper, and voicing our opinions at a young age. "Today's bored student is tomorrow's apathetic citizen. Today's nonreader is tomorrow's nonvoter" (Carroll, 1987, p. 9).

The lack of interest from students toward social studies can be attributed to a multitude of reasons. My goal is to find as many ways possible to change these negative images ingrained in students early on. The most important step in generating interest is to grab your audience and get their undivided attention. Once you've got the attention of the students, then you can begin educating them and attempt to reach worthwhile goals instead of arbitrary ones. Important goals like displaying good citizenship and improving critical thinking skills cannot be reached if the student's personal goal is memorizing enough information to pass the upcoming multiple-choice test. A good teacher must have many methods for grabbing their audience and encouraging active participation. One method I think adds interest in the classroom and encourages activity is addressing controversial subject matter.

Simply turn on a television or read a newspaper and you will soon learn that people pay attention to controversy. There are many ways to successfully cover controversial subjects in the classroom, but those same methods can be a potential distraction if not planned or carried out properly. There are many topics that can be enlightening and engaging, but there are also topics that may be inappropriate. A good teacher knows his or her students and what methods and topics to use or avoid. "There is no perfect solution to the teaching of controversial issues that will work for every issue, irrespective of time and place." (Lieb, 1998, p. 230). Introducing controversy into the classroom should be a calculated move to avoid any problems that could arise in or out of the classroom, but, if done properly, the methods can be tremendously

successful. The goals for social studies education cannot be met by passive students, so finding ways to encourage activity, discussion, debate, and persuasive writing are essential. Instruction that introduces controversial subject matter is one way to work toward useful goals.

Review of Literature

In my research for literature regarding the use of controversial material in the classroom, I found that most published works of educators and scholars favor the practice. My pursuit of articles favored those that agreed with my theory, but many article titles I found did not indicate the opinion of the writer, and still the majority of articles I found favored teaching controversial subject matter.

Controversial issues get the attention of students, which then leads to personal research, analytical thinking, opinion formation, and hopefully societal participation. "Research suggests that discussing controversial issues in elementary and secondary schools will counteract attitudes of apathy that have characterized persons of voting age for the past decade" (Cook, 1984, p. 3). The goal of social studies educators is to inform students about the world they live in and their position in it. In theory, a student who acquires this knowledge will be a more responsible citizen. "The rationale for including controversial issues in social studies instruction rests on the necessity of preparing citizens to participate in the democratic decision-making processes within a pluralistic society" (Evans, Avery, & Pederson, 2000, p. 296).

The National Council for the Social Studies places the same criteria on educators and states teachers should, "help young people develop the ability to make informed decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world" (Foster & Padgett, 1999, 358). The intensions of the NCSS are honorable and most social studies educators would agree with the correlation between informed students and responsible

citizens. The key for an educator is to keep the student's attention and generate interest in the subject matter, which has not happened in many social studies classes. “Rather than view the passage of history as relevant to their own lives, too often students, consider it a dry, dusty subject remote from their own experiences” (Foster & Padgett,1999, p. 357).

There are scholars and secondary educators who oppose the use of controversial material and feel that a movement of anti-Americanism is taking place in the policies of the National Council for the Social Studies. One NCSS panel member at a conference in New York commented that social studies teachers, following the September 11 attacks, need to de-exceptionalize the United States and teach students that we are just another country and another group of people. (Hymowitz, 2002, p. 1) The NCSS is obviously not trying to generate an anti-American sentiment among students, but statements can be powerful, and teachers should consider the effects that particular material will have on the attitudes of students. “Deeply cynical about the American idea, they (the NCSS) lack the vaguest understanding of the Founders’ vision of education as the wellspring of self-government” (Hymowitz, 2002, p. 1).

The social studies classroom must show students that, within a democratic society, change requires participation. A proven technique for generating interest and participation in the classroom is presenting controversial issues, and encouraging students to take a well-informed and opinionated stand. “Controversy and compromise are central to democracy, but if students are led to believe that the work of democracy is done, that no problems remain unsolved, they will see no need for their involvement” (Carroll, 1987, p. 9). Some instructors favor students formulating a rational stance on a controversial issue by means of research and critical testing. According to scholars Marcel Fredericks and Stephen Miller, the instructor has an ethical

obligation to instruct students in the major controversies inherent in the discipline (Fredericks & Miller, 1993, p. 162).

Other instructors favor in-class discussion or formal debate on controversial topics. Amy Hoffman, a social studies teacher, declares, "My goal is not to teach students to agree with me, but rather to encourage in them curiosity, creativity, open-mindedness, and critical questioning" (Hoffman, 1991, p. 5). Jonathan Leib discusses the fine line that educators must walk in bringing controversial material to the classroom and the importance of a teacher presenting impartiality toward the issue. "Our goal as teachers is to provide students with a way for understanding and thinking about controversial issues rather than teaching them what to think about those issues" (Leib, 1998, p. 231).

Research conducted in 1967 by Harmon Ziegler found that teachers did not regard the classroom as an appropriate forum for discussing controversial issues due to the probable sanctions that a teacher could face. In his study, Ziegler found that the classroom "operates basically to reinforce a belief in the desirability of maintaining the status quo" (Evans et al., 2000, p. 296). Other studies discovered a teacher's willingness to discuss controversial material depended on the broad political culture of the time (e.g., high in the 60's and low in the 80's), the teacher's experience, the teacher's gender (higher among males), and the topic (Evans et al., 2000, p. 297). Another experiment assessed the sensitivity of controversial subjects in the 1990's by questioning 32 social studies student teachers. The topics this population found the most taboo were abortion, pornography, personal family problems, obscene language, religious beliefs, sexual orientation, and criticism of school administration. More than three fourths of all the topics listed by student teachers related to either sex or race (Evans et al., 2000, p. 297).

Scholars and educators, who favor the use of controversial material, generally have negative opinions of social studies textbooks. Many educators feel social studies textbooks avoid controversial material and should serve as a reference book rather than a curriculum guide. "While textbook authors tend to include most of the trees and all too many twigs, they neglect to give readers even a glimpse of what they find memorable: the forests" (Loewen, 1995, p. 4). Civics textbooks, for example, should allow students to examine the government and decide how they want to participate. Following a review of textbooks in government courses, James Carroll commented, "If these books are representative of how government is being taught, then government is a dead subject" (Carroll, 1987, p. 8). The voter turnout for the 2000 presidential election was 40% of the total voting age population.

Textbooks and library books also face problems with censorship and removal due to controversial material. "Eighty percent of the civics books and half of the government books minimize conflict and compromise" (Carroll, 1987, p. 8). A general disinterest from students in social studies is traceable to the textbook's lack of interesting material. Even more alarming are the rights of parents to remove books from school libraries if they see them unfit for their child. "These parental rights become censorship when any person, parent, or group removes a book from the library shelf that denies other people's children access to that material" (Swiderek, 1996, p. 592). Removing material from libraries denies a student the right to pursue his or her personal interests and inhibits their ability to make a critical assessment of an issue.

> To be educated means to be allowed to think and wonder about ideas and their consequences; to be indoctrinated means to hear only about acceptable values, beliefs, and traditions of a group. These two philosophies on schooling make compromise difficult, to say the least (Swiderek, 1996, p. 592).

"Teachers must fulfill their function by precept and practice, by the very atmosphere which they generate; they must be exemplars of open-mindedness and free inquiry" (Gottlieb,

1989, p. 420). Most social studies teachers understand their role in the educational system, and agree with the goal to influence students to be responsible citizens with sound decision-making skills. Students can learn to think critically and analytically about government, society, and history, but getting their attention is the first step. Textbooks will not do it until authors and editors worry more about content than sales figures, so the responsibility falls fully on the instructor. Research and teacher's accounts have shown that controversial issues invoke responses from students and hold their interest. A successful teacher can generate interest and set classroom goals that go beyond passing a trivial multiple-choice test. "Once you have learned how to ask questions—relevant and appropriate questions—you have learned how to learn, and no one can keep you from learning whatever you want or need to know" (Loewen, 1995, p. 306).

Data Collection and Results

This project, testing the effectiveness of controversial issues in the classroom, took place in two separate classes. The purpose of the project was to test whether the discussion of controversial topics would get the attention of students, get students involved during the class period, and make relevant connections between the historical events and modern issues. The informative sector of the project was based on some information giving by the instructor, a discussion guided by the instructor, and an essay written by the students.

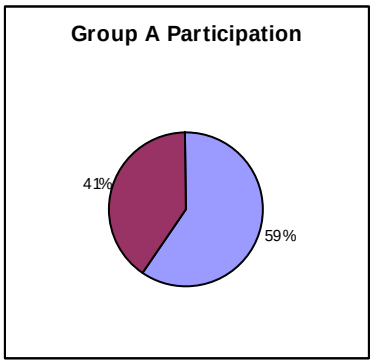
The first class, or Group A, was the control group in this study. Group A was given a current issue that they would find interesting, and contain less controversy than the issue given to the second class, or Group B. For Group A, I found an issue that they would be familiar with but would find very little to argue about within it. I chose the Kobe Bryant rape trial because I knew it would spark interest and familiarity with most of the students in the class. First, to avoid

debate on the obvious controversies within the case, I made it clear that the students were not to look at the activity as a platform to voice their opinion on the guilt or innocence of the accused. Group A was given two articles on the trial that covered the media's role in the case, and the rights granted and denied to them in this particular case. The object was to have the students read the articles to set up a discussion. The discussion was based on the media's ability to bring news to the general public and their First Amendment rights. The object was to get students to express their opinions of the modern media's role in society and show the similarities and differences it shows to the media of the Gilded Age. Following the discussion, the students wrote an essay from the following questions: How much is the media involved in our daily lives today? Is the media too important today? How much influence do they have on our decisions and perceptions of people, other places, other events, and ourselves? Has the media always taken advantage of its First Amendment rights to inform the public?

The second class, Group B, was the experimental group in this study. Group B was given a controversial topic that is currently in the news. They were given two articles that highlighted both the pros and cons of banning the phrase "under God" from the Pledge of Allegiance in California. The students were encouraged to take a side on the issue and use the information provided in the articles to support their beliefs and opinions. Students who were neutral on the topic were encouraged to listen to the upcoming discussion, ask questions from both sides, and choose a side if they wished to follow the discussion. The object of addressing a controversial topic was to get students to take an informed stance on the issue, actively debate their opinions, and compare the case to the material studied in previous classes on the Gilded Age. The one problem I ran into during the discussion was that everyone in the class took the same side on the issue. Group B was then given an essay assignment following the class

discussion with the following questions: "How does the First Amendment apply to this particular case? Which side do you agree with and why (use the articles to back up your argument)? Who is this issue important to? Why is a ruling in your favor important to the future America? Is this an issue that public schools dealt with in the past?"

My first concern was to address the lack of participation from students in most social studies classes. No statistical data can provide information on the level of participation in a classroom, but having taught both of these groups I can attest that they showed more interest on these lessons than on a typical day. Group A, the control group, was given a topic that most everyone in the class had an opinion to voice. The problem was, which I should have predicted before and used another topic, that most of the comments had to deal with opinions of innocence or guilt. I had notified them that the guilty or not guilty verdict was not the focus for this discussion, and the hands started to drop. Throughout period, I counted and wrote the names of 13 people out of a total of 22 who had an opinion on the specified topic. Group B, the experimental group, had 12 people out of 20 participate in the discussion. The percentage was not much higher than Group A, but this is also the less involved class between the two from my 7 weeks with them. The following chart shows the number of participants out of the whole for each class. In the charts, you will see that Group B has a slightly higher percentage of participation with 60% while Group A has a participation rate of 59% (see Figure 1).



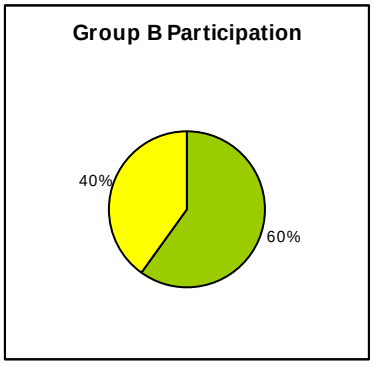


Figure 1. Group participation percentages.

My first criteria for judging the essays was based on an essay rubric I created. A good essay would first state an opinion, use the articles to defend that opinion, compare the situation to another issue with which they are familiar, and develop a conclusion to summarize what was said in the essay. The rubric was written on the board in outline form and students were told they would be graded based on their organization and expression of ideas (the essays were not actually counted as a grade for the students). I graded the essays for each class and scored as would had they appeared on test. I kept the scores in multiples of five to keep the information clear and easier to interpret. The same rubric was used for both classes and I had students put their names on the back of their sheets (for collection purposes I said) in order to prevent any potential bias.

The line graph depicts the scores of both classes with Series 1 representing Class A and Series 2 representing Class B (see Figure 2). The bar graph represents the total average scores of both classes. The bar graph represents class averages with again Series 1 as Class A and Series 2 as Class B.

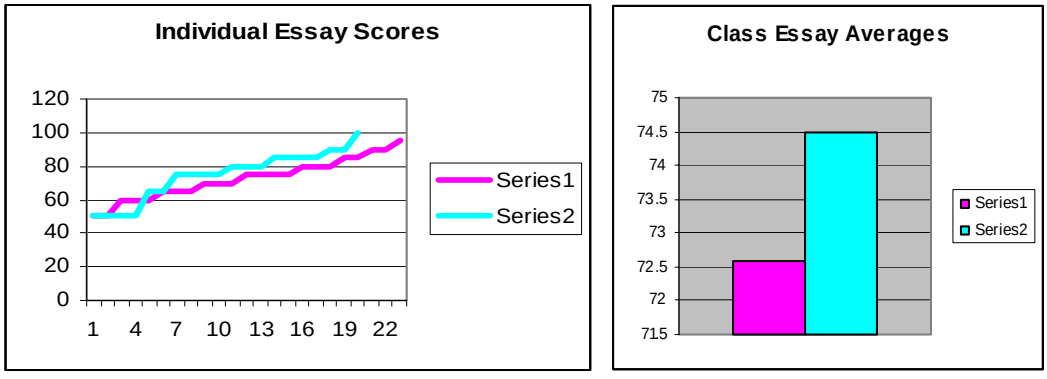


Figure 2. Individual and class essay scores.

The line graph showing individual scores shows that Group B performed better overall with one student scoring a “100” for the essay. To help interpret the chart, a “50” was given to any

student who either turned in nothing or simply gave up after two or three sentences into the essay. There were more students who scored a "50" in Group B than Group A, and, had they done their work, the class average would be much higher than it is. The bar graph shows both class averages. Group B had an overall average of 74.5 while Group A had an average of 72.6.

My next criteria for judging the effectiveness of my method was the use of comparison or contrast between the current issues and ones discussed in class. The charted data shows this only slightly with the higher scores going to students who were able to make those connections in their essay. Many students attempted to compare events and issues, but few stretched comparisons back to the material that had recently been covered in class. Group A ideally would have made comparisons to the print media, photojournalists, and advertisements that helped break up political machines, bring the realities of industrialization to the general public, bring corrupt politicians and business owners to trial, and change the face of American society as literacy and printing capabilities improved. A student in Group B could have made a connection between the Pledge issue and the development of public education, the religious policies of public schools in the late 19th or early 20th centuries, the demographic characteristics of schools in the Gilded Age, or examples of First Amendment rights protection or abuses toward early immigrant students. Overall, for these criteria, Group B did a much better job of making relevant connections between past and present. A good number of students from both groups made mention of past events, but most of it was a general statement of something said during the class discussion. One student, the "100" in Group B, made good use of the material covered in previous classes in his/her essay.

Conclusions and Recommendations

In conclusion, the most relevant generalization that can be made from this study is that controversial material does get the attention of the students. Seeing that the lack of student attention seems to be an epidemic in social studies classes, this a good first step in eliminating the problem. The difficulty with addressing controversial material in the class is finding a way to make the information useful or relevant to the field of study once it has been introduced. It takes time and practice for students to start thinking critically and comparatively about the information they encounter, especially if they are not used to this type of activity. A good teacher can take that energy and activity that comes from student interest and make them find answers and reach for possible connections. The data I received showed a slightly better performance from the group that was subjected to the controversial issue, but I had a difficult time getting them to find or reach for the connection. Another problem with this type of research is the difficulty of numerically rating the effectiveness of the instruction. I could personally tell that the students were much more interested in the information that was introduced, based on the level of participation and the energy in the classroom, but these things are hard to put into numbers.

Throughout my research, I found that most social studies teachers approve this method of instruction because they, too, have seen the increase in response that comes from it. The combination of teacher experience and student familiarity with the process only makes it more successful in the classroom. While teaching controversial issues is widely practiced, it is also warned that a teacher plan well ahead, know his or her audience very well, and know his or her own rights as a teacher. I did not find any grants available for a study on this method; perhaps the educational system does not want to recognize any practice that may challenge personal beliefs. The use of technology could greatly benefit students who wish to research information

on their own. They could use the internet or computer-based library searches to look for more information that either supports or opposes their stance. The more informed a student is toward both sides of an issue, the more confident he or she can be that their outlook is justified. Any activity that will engage students in a pursuit of information will make them more capable and more knowledgeable. Teaching controversial content, as defended by many in the educational field, is a necessary means of keeping an interesting and informative classroom, and that is what social studies courses need to be if they want to have a long-term effect on a student.

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Investigating the Effects of Motivation on

Assignment Completion

EDUC 590

April 15, 2004

David E. Hale

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project (no number assigned).

Introduction

Introduction of Problem Statement

The first 2 years of teaching came complete with a startling realization. That realization was that public schools didn't operate the same way that they did when I last attended 22 years earlier. The more that I struggled to find similarities between the experiences that I had in school and what I was observing now, the more bewildered I became to find that the rules have completely changed. It seemed to me that the expectations for the students had been lowered significantly. My first reaction was that I must have been placed in a poorly-managed school with a difficult student population. As I started to communicate with other teachers, at other schools, I soon discovered that the experiences that I was having with my students were the "status quo," not only in Hamilton County, but in public schools all across America.

Many of the experienced teachers that I communicate with share my observations that the old ways of public education are gone. They have told me that the students are different, the families are different, the teaching responsibilities are different, and the atmosphere of learning is different. The common approach that most older teachers seem to take is to roll with the tide. The perception is that there are too many problems to overcome; therefore, as teachers, we should just try to maintain modest expectations and wait for the administration or national educational leaders to transform the entire system with a dramatic change of policy or methods.

In an effort to be proactive with my own teaching methods, I have made the decision to attempt to effect a change in one of the problem areas that I consider significant. This area is mainly centered around student motivation, or lack thereof. The overall cause of the problem may well, indeed, be due to a source that will be hard to quantify, but there is a related, detailed problem that I have observed over the past 2 years that I feel can be quantified. This problem

desperately needs to be addressed. This problem is occurring in my classroom and I am sure that it is present in almost all classrooms in the public education system. This problem is the low rate at which students complete their assignments and turn them in, on time.

Description of Problem

The first few assignments that I gave to my biology students 2 years ago were very simple and could have been completed during the time provided in class, by most students. The number of students, however, who completed the work and turned in the assignments, when they were due, was very small. On a percentage basis, only 20 percent of the students finished the work on a timely basis. As the year progressed, this percentage remained at this very low level. Only through several modifications to my assignment requirements were any changes made to this “on time” percentage.

The modifications that I made to my assignments were, for the most part, out of frustration and desperation, and not as a result of recommendations from established educational principles or a systematic program. There was, however, a positive change in the number of completed assignments as the year progressed. I feel, that with diligent research, one would be able to identify methods that could be instituted in the classroom that would increase the amount of work turned in on time by the students. I believe that I will be able to show that modifications can be made to the structure of assignments, modifications can be made to the rewards that come from the completion of the assignments, and modifications can be made to the impact that failure to complete the assignments has on the students to such an extent that the rate of assignment completion will increase.

As the overall rate of assignment completion increases, this research project will also enable the determination of which of the modifications were more instrumental in increasing the rate at which the students were motivated to complete their assignments.

In addition, comparison of the percentages of assignment completion with the results of the Gateway examination will show the correlation between assignment completion and student performance, as measured by test results, for the test project group.

Population

This research project will utilize the involvement of 127 subjects who are high school students in the 9th through the 12th grades. These students range in age from 13 years of age through 18 years of age. The students are all members of my high school biology class, and the project will use the data of assignment completion from the assignments given in this class.

The subjects are students at an urban high school that could be classified as an inner city school. The students are predominantly from the lower to lower-middle socioeconomic levels. The ethnic make-up of the population is 86 percent African American, 10 percent Caucasian, 2 percent Asian, and 2 percent other. Fifty-eight percent of the group consists of females; 42 percent are males.

Measurement

The data that will be studied will be the percentage of students that complete an assignment on an “on time” basis. “On time” simply means having the assignment turned in when it is due, as assigned by the teacher. This data should be very easy to interpret, as the only two possible outcomes will be completion or noncompletion. The data, when merged as a group, over time, should show which assignment modifications proved to be the most successful.

Procedure

The project will be carried out over one semester. This period contains 19 weeks. During this period, about 51 assignments will be evaluated for each student. Some of the assignments will be very simple, such as asking the student to answer four or five brief questions and define 8 to 10 vocabulary words. Other assignments will require more effort and time such as a research paper on a particular topic. These are typical biology assignments. When each assignment is given, a definite due date for it will be announced. If a student turns in the assignment with over 60 percent of the assignment being completed, then he or she will be said to have completed the assignment on an "on time" basis.

The project data collection period will end a few weeks prior to the end of the semester due to the preparation time needed to prepare for the Biology Gateway Exam, which is administered at the end of the semester.

The first 2 weeks of the semester will be used to assign student work, without any assignment modification. The students will, simply, be told to turn in their assignment at a specific time. The second 2-week period will be the first time that I will modify the assignment in order to induce more students to complete the assignment on an "on time" basis. In this second, 2-week period, the students will be given a free homework pass if they complete all of the first four assignments in this assignment period. The complete listing of assignment modifications and projected times of use are shown in Figure 1. Notes to further explain the assignments follow the listing.

Week	**Modification**	Positive or Negative Reinforcement	Number of Assignments during period
1 & 2	None	Neutral	7

3 & 4	Free homework pass	Positive	7
5 & 6	Note home to parent for each missing assignment	Negative	6
7 & 8	Extra credit for “on time” completion	Positive	7
9 & 10	Phone call or requested parent meeting for missing assignment	Negative	6
11 & 12	Reduction in the amount of work required	Positive	6
13 & 14	Extra assignment added for any missing work	Negative	7
15 & 16	Test waived for completion of all assignments	Positive	5

Figure 1. Assignment modifications and projected tie of use.

A control period will be considered to be the first 2 weeks of the study during which no assignment modifications, or assignment polices, will be given. Only the due date will be given during this control period.

Notes To the Modifications of the Assignment Instructions

Free homework pass: Students will be told at the beginning of this assignment period that, if they complete the first three assignments, they will be given a pass that can be substituted for a homework assignment within the next 2 weeks. For every three assignments completed, a new pass will be given.

Note home: Students will be told at the beginning of this assignment period that, if they fail to turn in any assignment, on time, they will have to have their parents sign a note from their teacher. For every missing assignment, a note will be sent home with the student for their parent to sign. No late (reduced) credit will be given to the student until this note is signed and returned.

Extra credit: Students will be told at the beginning of this assignment period that, if they complete all of their assignments during the first week of this assignment period, they will be given 10 extra points on their next exam. The same policy will also be in effect during the second week of the assignment period.

Phone call: Students will be told at the beginning of this assignment period that, if they fail to turn in any assignment, on time, a phone call or conference will be scheduled with their parent or guardian.

Reduction of assignment: During this 2-week period, the assignments will be modified to such an extent that they can be completed in a very short amount of time. The students will be told that the work load is being decreased and that they should take advantage of the opportunity to complete the assignments in class, if possible.

Extra assignment: Students will be told at the beginning of this assignment period that, if they fail to turn in any assignment, on time, an additional research and writing assignment will be required of that student.

Test waived: Students will be told at the beginning of this assignment period that, if they complete all assignments during this assignment period, they will not have to take the exam for this assignment period.

Analysis

The analysis of the data will consist of a calculation of the percentage of the completion of “on time” assignments for each assignment. These percentages will then be grouped in categories that correspond with the various modifications that were made to the assignment instructions throughout the year. From these percentages, I can determine if the modifications had any impact on the assignment completion rate. I will also be able to determine which of the assignment instruction modifications were more instrumental in increasing the rate at which my students were motivated to complete their assignments.

Comparison of the percentages of assignment completion with the results of the Gateway examination will show any correlation between assignment completion and test results for the test project group and the control group. This analysis will not be available until after the publishing of this study due to the time frame for administering the exam and receiving the scores.

Research and Review of Literature

There is one strong assumption that must be made when approaching the problem concerning the importance of completing student assignments. That assumption is that there is merit in completing the assignments given to the student by the teacher. It seems that this assumption is not always the case as teachers are encouraged to use alternatives to the traditional assignments. These alternatives enable the student to, theoretically, capture the mastery of the subject by osmosis. My research project will take the position that assignment completion is

important. I will assume that mastery of a subject comes through practice. That practice, in academic pursuits, begins with the assignments given to the students by their teachers. The completion of these assignments will lead to a more complete understanding of the subject and failure to complete the assignments will result in a poorer understanding of the subject. A correlation of the relation of completed assignment to student performance will also be shown in my project.

The act of completing an assignment provides more than an academic benefit. This benefit goes to the core purpose of education. From a very early age, I have repeatedly been told, by all of the educators in my family, that the most important purpose of education is to instill one quality. This particular quality will enable anyone who possesses it to be successful even if they are not blessed with the intellectual capacity to be successful otherwise. That quality is to require us to do the things that we have to do, when they have to be done, whether or not we wish to do them. Completing your assignments is absolutely necessary, therefore, if you agree that a leading purpose of education is to instill responsibility in the student.

After coming to grips with the importance of assignment completion; value can be placed on the problem that we are researching. That problem is that not all students complete their assignments. As a matter of fact, an overwhelming number of students, for one reason or another, choose not to complete their assignments. The research reviewed lends ideas and opinions as to why this phenomenon is occurring. The focus of this research is to find out what variations can be instituted, to the assignments and otherwise, that would increase the percentage of the number of completed assignments in my high school biology classes.

This issue heavily involves the motivation of students, in my opinion. A motivated student will complete assignments. This research will attempt to identify ways that students can

be motivated to become more proactive with regard to completing assignments. Motivation can be added to the equation in two forms: positive and negative. The positive motivation will come in the form of rewards, extra credit points, praise, or relief of future duties or assignments. The negative motivation can come in the form of reduction of points, parental contact, or the addition of extra work. The literature offers some ideas as to what might work but I am taking the approach that there could possibly be an untried approach that might prove more fruitful. In reviewing the research, I was particularly mindful of the approaches that have proven merit, as well as for ideas that I feel can be molded into my project.

Recognition of the Problem

My experience is that only 20 to 30 percent of my students complete their assignments on time. The same low level of assignment completion was noted in a recent study of middle school math students in Florida (Garner, 1991). Although not directly reflected by statistics, many of the literature pieces reiterate that the lack of completing work is a major problem in today's schools (Pintrich, 1996; Poston, 1991). This problem is more prevalent in school environments where the possibility of student failure is more probable. These environments would be in inner city schools, high-poverty area schools, etc. (Brophy, 1986). Although the percentage of students who complete their assignments might be higher at non-high-failure-rate schools, the problem is at alarming levels in all public schools.

Possible Causes of the Problem

The common excuse for the poor performance of education in America, over the past 30 years, is that the students have changed. The traditional structure of the family has changed. The values of the family have changed. The psychology and personality of the student has changed. These same excuses are reflected in many of the literature pieces (Ames, 1990; Educational

Leadership, 1987). The students who perform well, complete their assignments, and take their education seriously are those who bring motivation from their homes and families. There are fewer and fewer of these homes and families who are able to provide this motivation as each year passes (Boberg, Carpenter, Haiges, & Lundsgaard, 1999). The motivation will now have to be provided by the schools and the teachers who staff them (Cross, 1996).

What Can We Do?

Several approaches are mentioned in the literature to address the problem of assignment completion. The first suggestion is to clearly communicate with the student about what is expected (Paulu, 1998). Now that the students understand what it is that they are supposed to do, what will motivate them to do it? Adjustment of the assignment is mentioned often (Paulu, 1998; Poston, 1991). Assign different assignments to match a particular student's capabilities with the work. Make the assignments purposeful (Garner, 1991). Keep the assignments short (Poston, 1991).

The literature also tells us that teaching our students the art of studying and effective study habits are important (Paulu, 1998). If these skills are missing, motivation may not be able to overcome the deficiency. Praise and rewards are a common suggestion (Brophy, 1986; Garner, 1991). These rewards can be as simple as a free homework pass for the next assignment to an elaborate monitoring system of assignment completion posted on the classroom wall. Many ideas were sparked when I read about the various reward possibilities and my project will definitely benefit from the use some of these ideas.

The most important aspect of the literature review was the reading about parental involvement. Although many parents are not a part of their children's academic lives, there is still a strong desire for the child to want to impress his or her parents. Having the parents or

guardian become a part of the assignment equation is, therefore, critical, in my opinion. This can be brought about in several ways. Require the student to have their homework reviewed and signed by a parent. Have the teacher phone a parent for positive and negative assignment news. Create assignments that can utilize the input of a parent (Paulu, 1998; Boberg, Carpenter, Haiges, & Lundsgaard, 1999). Making the parents become a part in the motivation of their childr is absolutely necessary.

Project Data

The study encompasses an entire semester of the 2003-2004 school year. It was the full length of the class for my students, as our school is on block scheduling. This would equate to an entire school year for a class that was on a regular school schedule. The study involved 127, predominantly ninth-grade students. Each student was assigned 51 assignments during this time period. A total of 6,477 assignments were analyzed. Each student was given a due date for each assignment. If the assignment was not turned in by the due date or if it was turned in on time but was incomplete, it was counted as an incomplete assignment in the study.

The entire study comprised 16 weeks. The assignment completion of each student during eight, 2-week periods was measured and recorded. During each period, assignments of the same type were given. A typical assignment would consist of (a) a three- to five-page reading assignment, (b) definitions for 7 to 10 vocabulary words, (c) a “what do you think” question that can be answered with a short paragraph, and (d) five or six short answer questions. A ninth-grade student with adequate reading skills should be able to complete these assignments in 30 to 40 minutes. Ample time was given for the students to complete these assignments during class. In addition, every assignment was not due until the beginning of class the following day, or it was due on the following Monday if it was assigned on a Friday.

The first 2 weeks were allowed to progress without any modifications. In other words, I didn't make any announcements about rewards or penalties that would be brought about by completing or failing to complete an assignment on time. Seven assignments were made to each student during this time period. Eight hundred eighty-nine assignments were made, in all. Two hundred seventy-six assignments were completed on time. This correlates to an "on time" completion rate of 31.

During the second, 2-week period, I announced that a "free homework pass" would be awarded to each student who completed each assignment for the week. This could potentially equate to two forgiven assignments over the 2-week period. The announcement of this policy was made daily. Seven assignments were made to each student during this time period. Eight hundred eighty nine assignments were made in all. Three hundred eleven were completed on time. This correlates to an "on time" completion rate of 35. This is an improvement of four percentage points above the control period rate. Thirty-five extra assignments were completed on time during this period.

During the third, 2-week period I announced that I would send a note home to the parents of any student who didn't complete all of their assignments for the week. This policy could potentially generate two notes to the parents of students who didn't complete all of their assignments. This new policy was announced daily. The results were dramatic. Six assignments were made to each student during this time period. Seven hundred sixty-two assignments were made in all. Four hundred twenty-seven assignments were completed on time. This correlates to an "on time" completion rate of 56. The assignment completion rate almost doubled from the figure that was experienced during the control period.

We experienced a severe decline in progress during the fourth, 2-week period. For every student that completed each assignment during each of the 2 weeks, they were promised an "extra credit" score of 10% to be added to each assignment. This extra credit could potentially apply to all seven of the assignments during this period if they were all turned in on time. This policy had very little influence on the students. Seven assignments were made to each student during this time period. Eight hundred eighty-nine assignments were made in all. Three hundred forty-seven were completed on time. This correlates to an "on time" completion rate of 39.

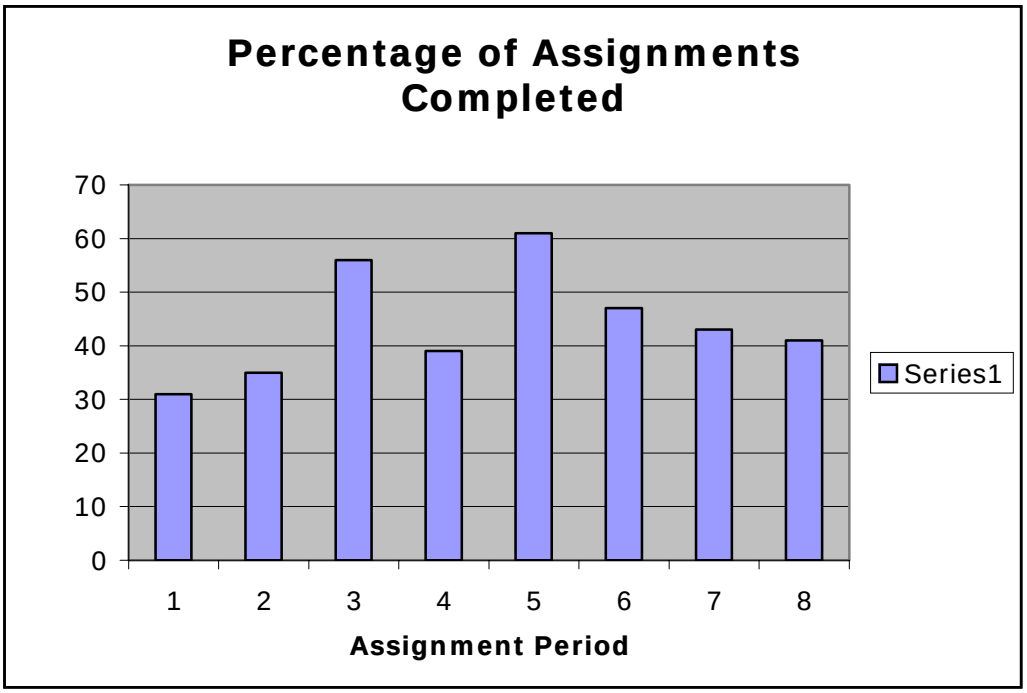
The best results were experienced in the fifth, 2-week period. I announced to the students that phone calls to parents of certain students would be made if the assignments during this 2-week period were not completed on time. This same announcement was made daily during the 2-week period. Six assignments were made to each student during this time period. Seven hundred sixty-two assignments were made in all. Four hundred sixty-five assignments were completed on time. This correlates to an "on time" completion rate of 61. I was very pleased with the results of this period.

The sixth, 2-week period brought about another serious decline in the completion percentage. For the six lessons that were held during this period, the class spent more time on demonstrations, experiments, and lecture time. At the same time, I decreased the requirements of the assignments significantly. I didn't announce that the assignment requirements were less and no one seemed to notice. Six assignments were made to each student during this time period. Seven hundred sixty-two assignments were made in all. Three hundred fifty-eight assignments were completed on time. This correlates to an "on time" completion rate of 47.

The seventh, 2-week period, introduced a policy that would require a student who didn't turn in all seven assignments on time to write a paper about the reasons that the assignments

were late. Almost all of the students that received this extra assignment also chose not to complete it. Seven assignments were made to each student during this time period. Eight hundred eighty-nine assignments were made in all. Three hundred eighty-two assignments were completed on time. This correlates to an “on time” completion rate of 43.

The eighth and final, 2-week period, allowed the students to skip a chapter test on the material covered if all assignments were turned in on time during this period. This policy didn’t prove to be much of a motivator to the students. Five assignments were made to each student during this time period. Six hundred thirty-five assignments were made in all. Two hundred sixty-three assignments were completed on time. This correlates to an “on time” completion rate of 41.



Qualifications

Throughout the entire project, 6,470 assignments were expected from students. Only 2,829 assignments were turned in, “on time.” This results in an overall assignment completion

rate of almost 44 percent. This rate is not very good at all. To be honest, however, I need to tell you that, by the end of the semester, I had collected almost 64 percent of all assignments. They weren't turned in on time but they were turned in. This was a very difficult task to accomplish and came only with constant reminders to the students, extreme amnesty and forgiveness on the part of the teacher, and, in good measure, as a result of all of the policies that were a part of this project.

Conclusions and Recommendations

What can we glean from all of this data? The most striking thing to me was the effect that the parental involvement had on the assignment completion rate. The threat of communicating a student failure to parents convinced almost 30% of the students to do their work. I truly believe that this figure would have been even higher if there were more parents available to the students that were a part of the study. Almost all of my students are from single-parent, broken, or no-parent homes. This is a sad commentary on the state of the American family but I believe that this study shows what effect could be achieved if more parents were involved in the lives of our students.

The small rates of improvement from some of the other motivators should not be ignored. As can plainly be seen there is no one silver bullet that will entice every student to complete his or her assignments. If a teacher chooses just one of the policies that I have suggested, they achieve less than grand results. It takes a tremendous effort on the part of teachers in America to motivate their students to perform and this study suggests that a variety of methods are necessary to reach today's students with less than perfect backgrounds, families, and motivators.

By utilizing all of the methods listed in this study, I was able to encourage my students to complete 64% of their assignments. This was no easy task. It should be mentioned, however that

this type of effort by American teachers will be required if we expect our students to be successful. As our families become less involved with the lives of our students, it will become the responsibility of teachers to find ways to motivate the students. As this study points out, however, when family is available, use it.

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Fourth Grade:
The Use of Math Manipulatives
in a Decimal unit

Jeanine Hardin

Spring 2004
EDUC 590 Culminating Experience
The University of Tennessee at Chattanooga
Professor D. McAllister

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-061.

Introduction

When adults think back to their elementary school days, one may recall a dynamic teacher who brought new ideas into the classroom, and used materials that were not in the textbook. How many adults can honestly say that that particular teacher was a math teacher? Math teachers are often limited to a specific and structured curriculum, which rarely provides student enthusiasm for the subject. Designing a mathematics curriculum which encompasses all the necessary standards, challenges students of all learning types, and involves higher order thinking skills can be quite demanding. The use of mathematics manipulatives in the classroom is one way to include all of these important traits of an effective mathematic curriculum. This study will discuss the use of math manipulatives in a fourth-grade math class, in which the area of study was decimals. In addition, a general overview of elementary mathematics current trends and ideas, including student achievement and National Council of Teachers of Mathematics' (NCTM) statements regarding the teaching of decimals will be addressed within this study.

As an elementary student of the 1980s, I was learning in the era of rote memorization. The math that I can remember learning in the upper elementary grades included a multitude of dittos and timed computation tests. Not once do I remember my teacher using any type of hands-on activity to emphasize a particular concept. As I have entered into the new millennium with a devoted will to teach, I am excited to change the old ways of my learning and bring to my students a teaching style that allows students to construct their own meaning through immersion and hands-on learning.

Review of Literature

The Early Grades

For teachers, there is a challenge of knowing not only what to teach when, but also when to teach what. According to Kathy Checkley, in *Educational Leadership,* this is especially true for math educators "who believe that children are capable of grasping key mathematical concepts at an earlier age than previously thought" (Checkley, 1999, p. 1). Young students can learn to think mathematically rather than simply memorizing algorithms and computation skills. A new focus is entering the world of elementary mathematics which shifts towards an emphasis on mathematical reasoning and problem solving. Students are learning to describe, compare, and discuss their approaches to solving real problems (Checkley, 1999).

When Tim Whiteford, a professor at Trinity College, gave a presentation at a conference in Vermont, he knew his attendance would be small. Why? Mainly because the subject was preschool mathematics. He attributed this low participation rate to "'perception that there is no math going on in preschool or kindergarten-or that the math at this level is so easy, it's not worth bothering with'" (Whiteford, cited in Checkley, 1999, ¶6). Nothing could be further from the truth. Children develop a sense of numbers at a very early age. They possess a natural ability to use a number system and, by age 3 or 4, begin to understand ordinal numbers, patterns, arranging, and ranking. By the age of 6 or 7, children begin to develop the concept of unit--something that can be the same or different at the same time. Once this concept is learned, children are ready for formal operations.

Carla Moldavan, an associate professor of mathematics education at Berry College, emphasized the importance of play and games when it comes to mastering basic math facts (Checkley, 1999). The use of games and manipulatives are vital in the basic concepts to numbers. Teachers should allow children to interact with manipulatives over and over again

until they trust what they understand. But allowing students to "play" for hours may be troubling for teachers. Teachers must understand that giving students time to manipulate physical objects may require them to adapt his/her own instructional strategies which will facilitate the child's natural desire for mathematics.

Student Achievement

As humans, we tend to achieve and succeed in areas of our own interests. Perhaps students are not aware of the beauty and magic of mathematics, often stating, "Oh, I am terrible at math!" This disinterest and distaste may be an indication of poor student achievement in mathematics. Achievement can come from not only curriculum material, instructional philosophy, or class strength, but also from resourceful teachers who bring relevant topics to their students with genuine enthusiasm (Posamentier, 2004). Teachers tend to become enthusiastic when they show something clever to their class. This is true for mathematics, as well. A math teacher should provide students with a plethora of fascinating materials, including real life items, which all involve math. By supplying and intriguing students with these materials, they begin to develop a deeper understanding for math, which, in return, develops a keener sense of achievement in the subject.

Learning and mastering the basic skills of mathematics allows for student achievement in the subject. Concerns over recent declines in U.S. student achievement in math is not due to cranky mathematicians, but due to the importance of basic skills being mastered. In the article, "The Arithmetic Gap," in *Educational Leadership,* (Loveless & Coughlan, 2004), they describe three reasons why basic skills are important for student achievement in math. The first reason is computation skills are necessary to advance in mathematics and the sciences (p. 56). Basic arithmetic skills are needed before a student may move on to the next, more advanced skill, say

algebra or geometry. If these basic skills are not developed, then the student will find it difficult to succeed in future math courses and even science. The second reason is that computation skills are increasingly important predictors of adult earnings (p. 56-57). Learning and mastering mathematic skills is not only for the future brain surgeons or rocket scientists. Studies have shown that mastery of such math skills is an indicator of future adult success in earnings. The third reason given by Loveless and Coughlan is that computation skills promote equity in math achievement (p. 57). Concerns are evident about racial equality regarding arithmetic achievement in the United States.

Decimals and NCTM- What do they have to say?

The main idea of NCTM's findings concerning the teaching of decimals is that "K-4 instruction should help students understand fractions and decimals, explore their relationship, and build initial concepts about order and equivalence" (Bennett, 2002, ¶1). According to NCTM, they suggest that teachers use physical materials that relate to real world situations. When teaching decimals, one should place a strong emphasis on models and oral language and connecting this with symbols. Much of the foundation of math in elementary and middle school was laid in Africa and Asia (Zaslazsky, 1996). Five thousand years ago, Egyptians were using a system of written numerals based on groupings of 10, as we do today (1996). NCTM suggests that using models, such as base 10 blocks, will assist in teaching students the concept of tenths and hundredths place value. These types of manipulatives can be used to include teachings of equivalent decimals, and comparing and ordering decimals.

Learning of decimals should be compatible with experience related to everyday life. At first, students may become familiar with a connection between ½ and 0.5. Both of these terms may be read as "one half;" they are the same amount. Once this is established, students may use

this relationship to determine that 0.6 is more than ½, and that 0.45 is less than ½. Understanding these representations is crucial in future problem solving situations a student may encounter. NCTM states that in grades 3-5, students should have learned that decimals are merely an extension of the base 10, place value system to represent numbers less than zero (p. 5).

Data Collection and Results

The following is a detailed description of the processes and outcomes of teaching a fourth-grade unit on decimals and the use of math manipulatives throughout the unit of study, both by teacher and students.

School Profile

This study took place at a K-5 school located in northern Hamilton County in Tennessee, with a school population of approximately 600 student (99% white, 21% free/reduced lunch).

The classroom environment was controlled for both tests. Students sat in their assigned seats, which happen to be in rows. They were instructed to clear their desks and talking would not be permitted during test taking. Students were allowed the entire 45 minute block to complete each test. They were encouraged to attempt each question but were allowed to skip questions they did not know. Skipped questions were not counted wrong.

The pre- and post-tests were identical (see Appendix A). The tests consisted of 29 questions, which included place value, comparing decimals, ordering decimals, adding and subtracting decimals, and writing decimal values in words. Prior to the pre-test, students had minimal knowledge of these skills.

The pre-test results showed that students were not familiar with decimals. The mean pre-test score was 10.4. There was an average of four questions which were not attempted, although these were not counted as wrong answers. The lowest pre-test score was 4 out of 29, scored by

four students. The highest pre-test score was 22 out of 29, scored by two students. My instructional strategies for this particular unit were to utilize two types of math manipulatives in demonstrating decimals. They were base 10 blocks, and overhead coins. I began my instruction by defining decimal terms, including tenths and hundredths place value. Base 10 blocks were used by both students and teacher. In relating decimals to everyday life, I chose overhead coins to show decimal relationship with money. I used the overhead coins and/or Base 10 blocks during every lesson for 2 weeks.

After 2 weeks of instruction, the post-test was administered. The mean score of the post-test was 17.9. The lowest post-test score was 6 out of 29, made by one student. The highest post test score was 28 out of 29, also made by one student. Figure 1 is a line plot comparison of each student's pre- and post-test scores. Figure 2 shows a student by student comparison of pre- and post-test scores and each students improvement. The best improvement by a single student was 20 points: pre-test score of 4, post-test score of 24. The least improvement by a single student was 1 point: pre-test score of 8, post-test score of 9. There were only two students who scored better on the pre-test than on the post-test.

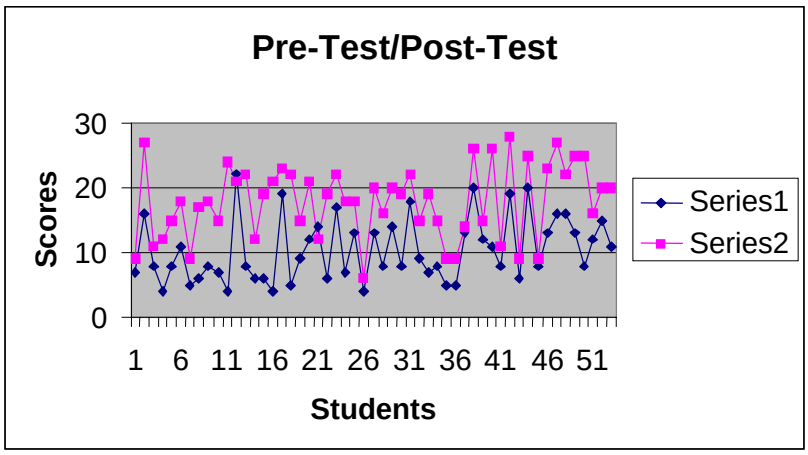

Figure 1. Comparison of each student's pre-test and post-test scores.

Student	Pre	Post	Improvement

	Test	Test	
1	7	9	2
2	16	27	11
3	8	11	3
4	4	12	8
5	8	15	7
6	11	18	7
7	5	9	4
8	6	17	11
9	8	18	10
10	7	15	8
11	4	24	20
12	22	21	-1
13	8	22	14
14	6	12	6
15	6	19	13
16	4	21	17
17	19	23	4
18	5	22	17
19	9	15	6
20	12	21	9
21	14	12	-2
22	6	19	13
23	17	22	4
24	7	18	11
25	13	18	5
26	4	6	2
27	13	20	7
28	8	16	8
29	14	20	6
30	8	19	11
31	18	22	4
32	9	15	6
33	7	19	12
34	8	15	7
35	5	9	4
36	5	9	4
37	13	14	1
38	20	26	6
39	12	15	3
40	11	26	15
41	8	11	3
42	19	28	9
43	6	9	3
44	20	25	5
45	8	9	1
46	13	23	10
47	16	27	11
48	16	22	6
49	13	25	12
50	8	25	17
51	12	16	4
52	15	20	5
53	11	20	9

Figure 2. Student by student comparisons of pre-test and post-test scores.

Conclusions and Recommendations

Decimals are a fairly difficult concept for elementary students to comprehend. I feel that the result of this particular study shows that the use of math manipulatives when teaching decimals to fourth graders may improve their overall understanding. In general, I was extremely pleased with the results. A total of 51 students showed improvement on their post-test, no students' scores remained the same, and only two students scored lower on the post-test than on the pre-test.

When manipulatives are used, the senses are brought into learning (Math Forum, 2004). By using manipulatives in a math lesson, students can touch and move objects to make a visual representation of the concept. The overall consensus from reviewing the literature on the use of math manipulatives is that, when used correctly with other teaching strategies, students' success rate will increase. There is still much more research to be done concerning this topic, and there are many resources available to math teachers to improve their teaching styles and strategies. Professional journals, such as *Teaching Children Mathematics*, workshops and conferences are a few ways for teachers to stay current with teaching trends. An updated list of NCTM's annual meetings and regional conferences may be obtained at the NCTM website (NCTM, 2003). The use of technology in the classroom would also be of great benefit to math students. Technology has the ability to enhance and extend students' learning. NCTM recommends that preservice and inservice teachers of mathematics at all levels should be provided with professional development in the use of instructional technology, and integration of technology into daily math lessons (NCTM, 2003b). By staying committed and becoming resourceful teachers of mathematics, we may begin to see a new generation who will boast about their accomplishments in math.

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Appendix A

Name _____Date _____ HB ____

Decimals
Pre/Post-Test

1) Given the number 1.24, name the place value of the 4. _____

2) Given the number 1.87, name the place value of the 8. _____

Use < , > , or =

1.	0.9	0.04
2.	0.06	0.18
3.	3.75	0.89
4.	1.27	1.28
5.	9.01	9.10

In 37.596

a. the 3 stands for _____

b. the 7 stands for _____

c. the 5 stands for _____

d. the 9 stands for _____

e. the 6 stands for _____

Round each decimal to the nearest whole number.

a. 2.6 _____ d. 0.7 _____

b. 3.01 _____ e. 9.23 _____

c. 52.9 _____ f. 24.83 _____

Put the numbers in order from ***smallest*** to ***largest***.

432 15 447 8,114 69 7 1.2 0.6 .14 2,865 5.6 .841

Solve each problem

a. 0.43 + 0.92 = _____

b. 4.06 + 0.09 = _____

c. 62.548 + 8.004 = _____

d. 3.21 - 0.8 = _____

e. 0.83 - 0.5 = _____

f. 5.024 - 1.999 = _____

Write each number in words.

34.5 _____

0.2 _____

9.456 _____

Write a number that has,

A 4 in the hundreds
A 9 in the tenths
A 1 in the ones
A 7 in the thousandths
A 5 in the tens
A 3 in the hundredths

____ ____ ____. ____ ____ ____

Analysis of Pre- and Post-Tests:
A Kindergarten Unit on
Patterns

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Dr. McAllister – EDUC 590
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The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-033.

Introduction

As you walk into any kindergarten classroom, you will discover that the room is full of many stimulating things. Bright colors decorate the walls, and letters and numbers introduce students to school. But, if you take a closer look, you will see that a lot of those things represented on the walls are a type of pattern. There could be color patterns, shape patterns, number patterns, or letter patterns. When you take the time to observe in a kindergarten classroom, you will quickly discover that their whole day revolves around a pattern – the same activity is repeated at the same time, each and every day (with very little exception or interruption). At this age, students need the consistency that a repeated daily schedule offers. Teaching about patterns is not just about being consistent or doing something fun for them (or you). It helps them learn about predictability and the structure of patterns and this, in turn, will help them develop higher-order, mathematical thinking skills which become more useful as they get older (Economopoulos, 1998).

Patterns, in the early elementary grades, is a common theme. Many teachers use patterns in their everyday routine and some will do thematic units on patterns. Students at this school had been exposed to patterns in their daily routine (mainly their calendar/number corner), thus my unit's purpose was to expand upon that knowledge and eventually introduce them to number patterns. Patterns are a required part of the county's standards and benchmarks. The Hamilton County Board of Education states that, "The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations. They will represent and analyze patterns and functions by – identifying patterns in the environment, in arrangements of objects, or in pictures,

recognizing and extending a concrete, visual, or auditory two- or three- part repeating pattern, and creating and describing a simple repeating pattern." They also state that, "The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one-, two-, and three-dimensional figures" (2000).

I created a unit that would help students attain those goals, beginning with shapes and introducing them to patterns using a variety of tools and eventually leading up to using numbers to show patterns. These students could already count by 2, 5, and 10 - I used what they knew to build upon. They eventually began to see the patterns created when highlighting those numbers on a hundred board. Students enjoyed the manipulatives the most - they were able to move things around and create their own unique patterns. I even introduced them to tangrams - using basic shapes to create new shapes and patterns. They were given copies of the answers that were enlarged enough so that they could take the shapes and make the patterns, like a puzzle. I had helped those that needed it and worked with others to show them ways to make their own new patterns. The culminating activity in my unit was to give them each a set of specific shapes. I had a pattern in mind, but they were to take the shapes given to them (each child having something different) and create a pattern with them. The only rule was they had to use all the shapes given to them. Many got the one I had in mind, but many took it into their own hands to create the pattern they saw. It was beneficial to both me and the students to watch the way they were thinking about patterns. I could see many using the shapes and many using the colors. There were a few who figured out that the pattern was not about the shape or the color of the pieces, but it was the size of each shape that created a pattern. The lesson ended well and students learned from the whole unit.

Review of Literature

Kindergarten curriculum requires that students learn to recognize patterns. In any given classroom, you will observe students at play with interlocking cubes or building blocks or any number of manipulatives. These manipulatives are usually found within the math center. What then does this tell us about children and patterns? Is it just about being able to put yellow, blue, yellow, and blue blocks in a repeating pattern? No. According to Karen Economopoulos (1998), the purpose behind teaching patterns is to enhance mathematical thinking in children at an early age. Recognizing and predicting the patterns is how most teachers approach teaching patterns; yet there is more to it than just knowing what comes next. Teachers are laying the foundation for advancement in abstract thoughts and generalizations (Burton, 1982).

Psychological literature agrees with educational research about how important teaching patterns is for students at an early age. In order for children to understand numbers and their properties, they first have to understand the repeating patterns in objects. Once that is achieved, the student's logical thinking skills will develop. (Tomic & Kingma, 1996). This is not to say that all pattern play will affect their thinking skills. The research says that, at an early age, the number of objects used will affect how the children will perceive the patterns. Tomic and Kingma (1996) say that the greater number of objects, the more difficult the ability to encode the information becomes. Using preschool through grade 1 students, their tests showed that children could detect patterns better with, at most, six objects, as opposed to increasing that number, even by four.

Economopoulos (1996) says that children can observe repeating patterns such as a simple yellow – yellow – green, yellow – yellow – green, or in a style that grows, like in clap – hop, clap – clap – hop, clap – clap – clap – hop. She also says that patterning emerges in many

ways for children, especially in their play with manipulatives. Eventually, they learn that patterns exist in their everyday lives. We use patterns when we drive (red light turns to green – we move). This article, *"What Comes Next?,"* wants teachers to look beyond their typical teaching of patterns, and to think critically about the way we look at mathematics and the way patterns are taught. Teachers commented on why they spent so much time on teaching patterns when they, themselves, were not sure of the reasoning behind it. One teacher said, "What is it that I should be doing in terms of questioning or providing the next activity that will deepen their understanding of pattern and stretch their thinking to a new level?" (Economopoulos, 1996, p. 2). This article shows teachers a way to communicate with each other and with their students to help them enhance the lessons about patterns. Teachers were shown ways to ask questions in typical patterning exercises. These questions allowed the teacher the opportunity to see the difference in the responses children would make to the different questions. In one example, an activity called, "What Comes Here?," students would use information that they already knew to predict a pattern. Teachers learned to see the difference in the two types of responses for which to look; these responses were: (a) to begin at first cube in sequence and "read" the pattern, or (b) if they would say that they see that the last color is this, so the pattern is this color and that color (Economopoulos, 1996). The answers are similar, but the difference is that, in the second answer, the child would be recognizing the two colors as one single unit.

When asked what comes next in an ABAB pattern, the answer may seem quite obvious to us. To a kindergartner, however, it is not always apparent. They need to really examine the pattern and figure out the relationships of the colors or shapes being presented to them. When they have figured out the relationship, it is not about making a random choice. At first they see that red follows blue, but eventually we want them to see red – blue as a unit of the pattern

(Economopoulos, 1996). Once they have seen what Economopoulos terms "regular relationships," students will have gained a mathematical concept: predictability (p. 2).

We then have to question what comes next: they are able to predict, now what? According to the research, the next step is to have students generalizing about patterns and recognizing that it is not just one unit: red-blue, but that they are repeating units and that is what makes up the pattern. It was the same as the goal for students in the previously mentioned activity, "What Comes Next?" When students are able to do this, they increase their mathematical thinking skills. The research says that this is what leads them in the understanding of numbers.

We teach patterns to children through the use of manipulatives, through daily calendar activities, and through a variety of repeating coloring activities. Can we do it through any other means? According to the article, "Mathematics and Mother Goose," we can. Patterns occur often in children's literature. Words and/or phrases are often repeated so that children may easily learn and comprehend the stories, especially nursery rhymes. Why not, then, use them to help with mathematical thinking skills? Won't children learn about patterning, ordering, recognizing attributes, and classification through nursery rhymes? (Young & Maulding, 1994). It is the rhyme and rhythm of the nursery rhymes that will help to encourage "listening skills, auditory discriminations, and language development" (Young & Maulding, 1994, p. 36). Students do not just learn the rhymes, but incorporate the use of manipulatives while they are repeating the rhymes. The children could hear the rhyme and rhythm and repeat it by using pattern blocks. An example mentioned in the article is that a child could use one color block to represent one repeating line in the rhyme. Young and Maulding say that what they learn by doing this is what is expected of them by the National Council of Teachers of Mathematics

(NCTM), which states, "Children from four to eight years old should be able to illustrate prenumeration concepts. Patterning, ordering, recognizing attributes, and classifying sets are all involved" (1994, p. 1). If a child is able to recognize that a line in a nursery rhyme repeats, and can use one colored pattern block to represent that line, the goal of the NCTM would be met.

According to the research of Susan J. Ditchburn, patterning is the best way to begin teaching young children about mathematics. Using something in which children are already fully immersed and which acts upon their own natural curiosity to learn will lead them towards understanding complex mathematical concepts. "The central purpose of any instruction in mathematics at the early childhood level is to help the child see order and meaning in the situations and events that occur in his day - to - day activities" (Ditchburn, 1982, p. 3). This article and the research discussed follow the previous articles mentioned in that patterning is very important in early childhood education. Teachers do not just teach about patterns; they need to understand what it is about patterns that is so important to the development of mathematical skills. Once they begin to see and understand patterns in shapes and colors, teachers need to then incorporate numbers into the pattern activities.

All research leads to the same conclusion. Patterns are important and should be taught at an early age. Teachers need to not only just teach about patterns, ordering, and sequencing, they need to understand how it all works and where we want children to go next with what they learn at this stage of their development. Teachers need to look at their lessons and evaluate them based on these findings. They need to create a balanced program that addresses all modes of learning (visual, auditory, and with use of motor skills). They must do this in a way that increases cognitive learning in the children. What they must not do is take pattern instruction lightly; they, too, must understand the goals that students must attain, and create the right

"pattern" of lessons that will build upon the last.

Data Collection and Results

Teaching about patterns was the idea of two of the kindergarten teachers at the school, where I was assigned my first placement. I began the unit with the pre-test which involved four questions where students had to complete a given pattern and a fifth question that left the design of the pattern up to them. Each question is worth 20 points to make the test worth 100 points. For the pre-test, the results ranged from a 40 to 100. The results were as expected – students understood how to complete shape or color patterns but had more difficulty completing the letter or number patterns and even some difficulty in designing their own; many repeated one already shown on the test. An example is if the pattern is ABC ABC, they can tell what will come next. However, when the pattern had both shapes (even though the shape remained the same) and colors, only two thirds of the class were able to recognize the correct color for the next square. The test was given to 18 children in a one-on-one setting; either my cooperating teacher or I took the child aside and had them answer the questions, which were read to them. From the pre-test I could see that, even though many could complete the color or shape patterns, I still had to start from the beginning. From the results, I determined that students could recognize patterns, but that they had a harder time in creating their own. They could determine what came next but did not fully understand that it was a unit that repeated (as mentioned in the research).

In the first lesson, students used the basic shapes they had been learning (circle, square, rectangle, triangle, rhombus, and hexagon) to create patterns of their own choosing. They had time to play with the manipulatives and then they had to draw what they created. It gave me time to observe who would need help in understanding patterns. The second lesson, Building Shapes, gave students the chance to use the basic shapes – rhombus, trapezoid, and triangles – to create one new shape, the hexagon. They were given plastic manipulatives and asked to use them to create hexagons. There were a number of ways to do this and they were to color in the given hexagon papers with their results. This introduced them to the idea that patterns are not just about repeating patterns, but about creating new shapes with the basic shapes.

The next couple of lessons dealt with number patterns. Students were reminded what a pattern was and they used what they knew to show patterns using interlocking cubes. They then were asked to count by 2, 5, and 10, and asked if these were patterns. We looked at the hundred

board and discovered that it was a pattern; from that, they saw other patterns throughout the board. They were introduced to the concept of an "unwanted guest." This allowed them to see that, within a series of numbers, there may be one that does not belong. It was a way to begin number sense and order.

The unit then took them through different ways to complete patterns and introduced them to patterns in more than just math. We read *Polar Bear, Polar Bear*, by Eric Carle, to show that patterns are in literature, and we looked into nature to see where patterns exist there.

The post-test was given over 2 days at the end of the unit. Two students did not take the post-test due to long absences. The results of the post-test show improvement in 31.25% of the students, 43.75% of the students stayed the same, and 25% of the students got lower scores. Figure 1 shows the results of the two tests. Figure 2 also shows the results of the tests and which questions showed improvement. The instrument is contained in Appendix A.

STUDENT	PRE-TEST	POST-TEST	IMPROVE/NOT
#01	100	40	LOWER
#02	60	80	HIGHER
#03	80	60	LOWER
#04	60	100	HIGHER
#05	80	80	SAME
#06	80	80	SAME
#07	100	100	SAME
#08	100	100	SAME
#09	100	100	SAME
#010	60	100	HIGHER
#011	60	80	HIGHER
#012	80	100	HIGHER
#013	40	40	SAME
#014	60	0	UNKNOWN
#015	60	0	UNKNOWN
#016	80	60	LOWER
#017	80	80	SAME
#018	100	80	LOWER

Figure 1. Pre-test and post-test comparison by score.

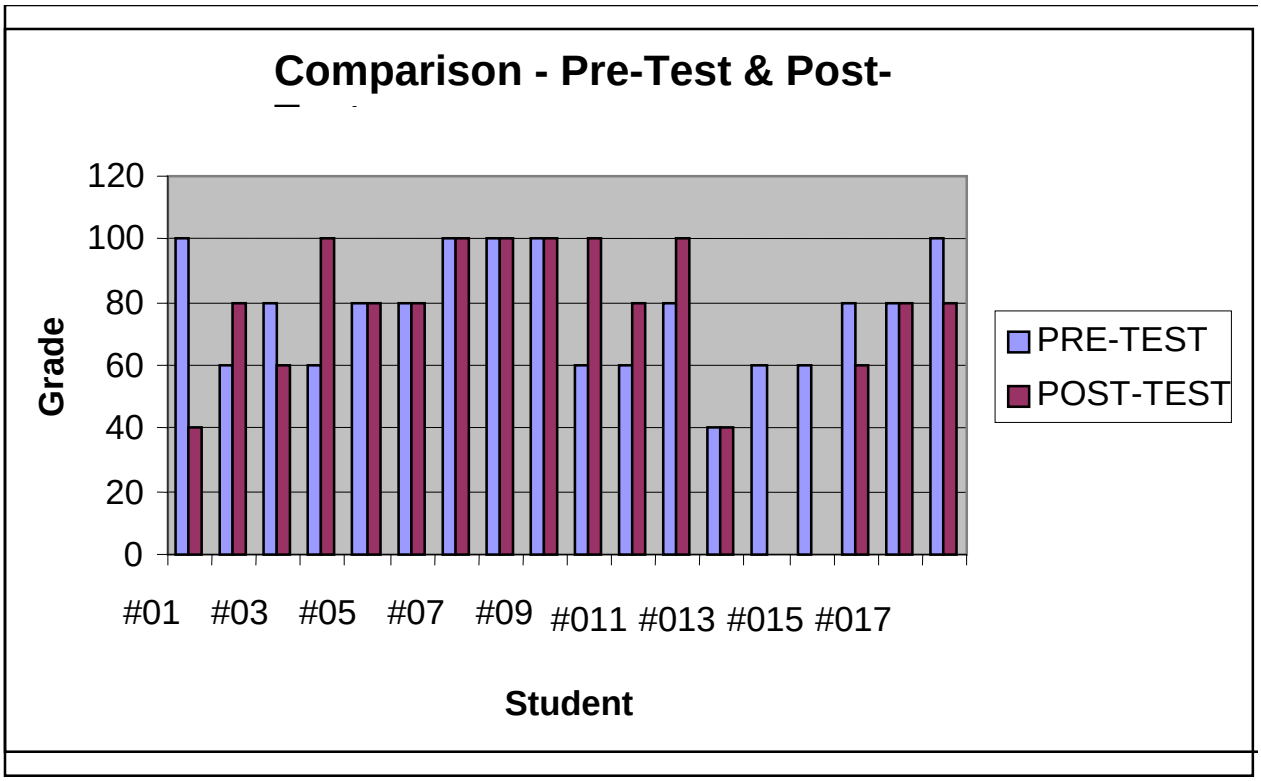

Figure 2. Pre-test and post-test comparison as a chart.

Conclusions and Recommendations

Teaching is an ongoing learning process for the teacher as well as for the students. Being a student teacher and experiencing this for the first time has led me to my first conclusion about this paper. I wish I had read more of my own research prior to completing the unit. I put together a unit that was required of me, and during the whole thing, I always felt a little disconnected, that each lesson did not flow into the next as I would have liked it to. This being said, it would have been easier had I read about the ideas in the articles about how to connect the lessons and how to get more from the teaching of patterns. I do believe the children learned something from the whole unit. But what I have to ask myself is this, "Did I increase their ability to think mathematically?" I used a variety of teaching styles and methods to incorporate visual, auditory, and motor skill learning styles into each lesson, but was that alone enough? Did

I ask the right questions so that the students were recognizing the unit and not just which one came next? Based on the results of my pre-test I cannot really say. Students, overall, did better on the post-test than on the pre-test, but the questions that they got wrong the second time were the ones that they got right the first time. I have one theory about this. The first time the test was given, my cooperating teacher did not fully understand what she was supposed to do and did not ask questions until half of the students had taken the pre-test. Then when I gave the post-test, students were brought in from recess in small groups to complete it. It was not by my recommendation to do it that way; it just happened. My thought about the post-test is that I might have changed the questions on it. The questions would represent the same things, but, as I learned during the 2 weeks, I was not asking the right questions. They would have represented the learning that took place during the unit. I felt that the questions I used were more for me to assess their prior knowledge, and the post-test should have represented what they learned rather than just repeating the questions.

My recommendation for anyone who will be teaching about patterns is to look at the research and understand why we teach patterns. In early childhood education, we may see a lot of things that look "fun," but are the students really learning what they are supposed to learn? When you have to teach so many different things, it is simply impossible to look at all the research behind everything, but knowing the purpose behind the lesson will only make the lesson, itself, more productive and beneficial, not only to you but to your students.

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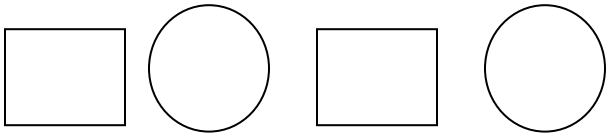
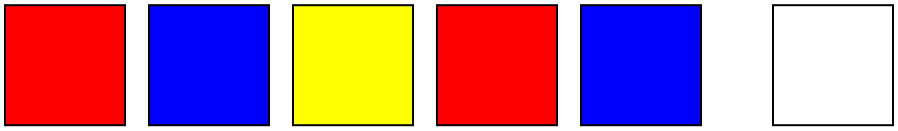
Appendix A

PATTERN RECOGNITION

Name:_____ PRE/POSTTEST

1.) 

2.) ABC AB__

3.) 

4.) 2 4 6 8 11 12

Draw your own pattern in the box.

Can A Student Teacher Direct Learning Centers in a Science Classroom and Increase Student Achievement?

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Introduction

Review of Literature

Motivating different kinds of learners in the same classroom can be a problem in education. Several investigators have suggested that individualizing instruction, teaching each individual in the way that the learner learns best, maintains interest and improves learning (Simmons & Smith, 1978; Dermer, 1980; Kasambira, 1984; Stephens & Wait, 1989). Use of learning centers is one method of achieving the goal of individualized instruction. Learning centers, also known as learning stations, inquiry centers, and activity centers, have been used since the early 20th Century. There is a wealth of information about the use of learning centers in the classroom, especially in early childhood and elementary education.

Perhaps, in an attempt to offset the complexity and impersonalization of an industrialized society, we have placed great emphasis on the individual. Individualized programs recognize the amount of time required for a student to gain a skill more than the amount of material learned. The Dalton Plan for individualized instruction was popularized after its introduction in 1919. It was a fad that was forgotten after several years. The Winnetka Plan, invented by Washburne in 1919, was used successfully in and around Winnetka, Illinois. *Created activities* were characteristic of the Winnetka Plan, as well as the belief that social and creative tasks should be separated from other routine skills learned. Much of the pedagogy of education today originated with the Winnetka Plan. These chronological summaries are also included in the literature review, *Learning Centers: A Sensible Approach*, by Dermer (1982).

Steve Dermer (1982) conducted a study on learning centers that includes a literature review, rationale for learning centers, historical perspectives, and a summary. Dermer's report also includes a section summarizing offerings from assorted authors of their different types of

learning centers—reading, writing, technology, manipulative, etc. He refers to Patricia Manning (December 1980) who advises that a learning center have six necessary components: (a) a management system, (b) clearly stated directions, (c) definite objectives, (d) multi-level manipulative activities, (e) method of evaluation, (f) simplicity and attractiveness. This list is expanded from her April 1980 article in *Science and Children* in which she recommends the first five above. The components are similar to those published in earlier years by various authors. Barbara Simmons and Paula Smith (1978), in *Education*, propose methods by which teachers evaluate students' needs to use particular centers and evaluate the various learning centers. Without careful planning and evaluation, the learning center is likely to become an area of play or busywork, and classroom chaos may ensue.

The ineffective learning center is demonstrated in *Learning Centers: What They Are and Aren't,* by Arlene Cooper (1981). The pitfalls of learning centers are mapped out and proper utilization is explained. Similarly, *Learning Centers: The Newest Thing in Busy Work?*, by Anne Fox and Mary Franke (1979), is a study in which teachers submitted learning center plans for critical evaluation. Their criteria for effective learning centers are similar to those already described. The problems with the submissions are categorized and quantified, and recommendations are made.

A recurrent theme in the literature is the rational use of space in designing classroom learning centers. Mike Hopkins, in *Rethink Class Design* (1993), recommends that students be involved in the planning of, and design of, learning centers. Students may then feel like valued, contributing members of the classroom community. Hopkins' article gives very practical insight about rotating activities, the use of space for storage of thematic units, types of storage containers, and using photographs of classrooms for reconnaissance and record keeping. Ideal

characteristics of specific types of learning centers are described. A soft, quiet reading center should be located away from traffic, and a space for cooperative projects should be flat and more open. Eventually, we are reminded that the location of a learning center relative to other centers can impact its effectiveness.

"Cozy learning centers make reading a joy instead of a chore for your students." So say Karen Stephens and Shirleen Wait in *Instructor* (1989). They say that learning centers address students' different learning styles better than traditional paper and pencil tasks. She lists materials that should be used in the reading center, listening center, writing and publishing center, computer center, and art center. Managing centers is easier if the teacher begins with a few centers and a good management system. Evaluation can be accomplished by the students, themselves. Then, without consequences, students are able to learn from their mistakes. In Westerville, Ohio's North High School, students create rubrics and evaluate other students' work (Shirley Newton, 2000). The students at this school use science centers to complete various aspects of their research projects. Multimedia, research, art, and communication skills are honed before presentations are evaluated by peers.

Indicative of the variety of ways learning centers can be used, Charles Hurwitz and Gerald Abegg (2000) advocate that students use computer center to create concept maps (mind maps) as an adjunct to writing notes in traditional ways. Hurwitz, a high school chemistry teacher, believes the concept maps help students to organize their thoughts. His students also use e-logs, e-mailing reflections, questions, and responses, then waiting for a response. The process saves time and paper, and maintains student interest. Grouping students three to a computer makes it easier to monitor computer use, and encourages collaboration among students in the group. Students need only vie for *mouse control*. Through the use of computer simulations,

students can observe three-dimensional images of atoms and molecules. The images can be rotated completely in any plane by pushing the image with the cursor. Abegg and Hurwitz, in *A Teacher's Perspective on Technology in the Classroom: Computer Visualization, Concept Maps and Learning Logs*, conclude that the use of computers in the high school science classroom improves visualization of three-dimensional structures, and that e-logs increase students' awareness of the concepts that are difficult to relate.

Sandra Oehring (1993) describes how she utilizes the one computer in her classroom. She suggests that the teacher first master the unit, and proposes the most useful software and hardware at he time the article was written. Oehring describes simple setups for monitors, outlets, data discs, keyboards, and other parts of the computer center. More than one keyboard can be attached to a computer for multiple student use; connecting the computer to a television or box-light allows the entire class to view a presentation. A list of Internet resources is provided, with descriptions, by Joseph Francis in *Use of Internet Resources in the Biology Lecture Classroom* (2000). Internet addresses are provided for digital video resources, interactive video resources, interactive web sites (including tutorial and evaluative), and an online text.

A few researchers, including Jane Healey (1998) and Todd Oppenheimer (1997) believe that computer technology in the classroom is just wasted time and money. Healy purports that computers reduce creativity and attention span, and that research supporting computer use is flawed and invalid. Ornstein and Levine (2003) display a list of seven other of Healey's criticisms. Oppenheimer concurs; *The Computer Delusion* is a long list of anecdotes about wasted money and disappointing outcomes of computer use. But even Oppenheimer has to concede that attendance seems to improve when computers are used in the classroom.

Whether the learning center is designed to meet a learning style, or learning objective, or other purpose, Peggy Snowden and Linda Garrin Christian support *Four Levels Of Learning Centers for Use With Young Gifted Children.* Their hierarchy of levels of learning centers is:

- Level one: Teacher-planned/teacher-directed
- Level two: Teacher-planned/student directed
- Level three: Student-planned/teacher directed
- Level four Student planned/student-directed

The first levels must be accomplished before students continue through subsequent levels. This article supplies concise philosophical, curricular, and instructional foundations for individualized instruction, learning centers, teaching across developmental domains (cognitive, affective, and psychomotor, for example) and the hierarchy of centers.

Researching mixed-age learning in interactive, social contexts, Sandra Stone (1998) offers compelling reasons to purposely group students at different stages of development. Cognitive, social, and emotional benefits are enumerated, and examples of activities are given. Buddy reading, peer tutoring, and discussions where students explain their views are a few of the ways in which students of varying levels can support one another. The developmentally more advanced students benefit as well as the less advanced students because they have an opportunity to express their knowledge, an incentive for the use of appropriate vocabulary and social skills. The literature reveals that authors have different basis for advocating the use of learning centers, yet almost all are proponents of their use. Guidelines have been introduced on the rationale for using learning centers, and for the proper implementation of the centers. There are instructions for the design of the physical space and the management of the students in the centers. Ideas for specific types of learning centers are offered – science, writing, reading, art, collaborative

projects, etc. There is also considerable pedagogy tailoring learning centers to students' dimensions of learning. Most writers recommend a gradual approach. Beginning with few centers and dimensions that are lower on the hierarchy, then working up to more centers and higher dimensions. Little empirical evidence in favor of learning centers can be found however, but none was uncovered against the use of learning centers either.

Problem Statement

Teaching seventh-grade mathematics at an inner city school in Hamilton County, Tennessee, presented many challenges for me as a teacher with few years of experience. Results of the STAR Reading Test and the STAR Mathematics Test indicated that students cognitively on grade levels two through nine were learning together in the same classroom. Tennessee Comprehensive Assessment Program (TCAP) results agree with this assessment that students at widely variable developmental levels are expected to learn the same objectives. Some students could comprehend complex algebraic concepts, while others didn't know how to line up multi-digit numbers when adding. How is it possible to keep everyone in the classroom motivated?

Slow learners sometimes feel that they are so far behind that they can never pass a test, much less a class. They may remain in the same grade for years without really trying to pass classes; eventually they might be socially promoted, or administratively moved up to the next grade. At some time, they probably actually tried to pass their classes but fell short. Fear of failure is a prominent defense mechanism. They never truly fail if they don't *try* to pass. Being retained due to poor attendance, frequent suspensions, or a bad attitude, causes less cognitive dissonance to adolescents than not being "smart" enough to pass. In fact, slow learners may be smart or very talented. A student may be an adequate mathematician who cannot read, a gifted artist who cannot write a sentence, or may be high in one or more of the other multiple

intelligences that is not routinely evaluated. The teacher who is not prepared to deal with these contingencies is in for a long school year, for students who feel disenchanted with education and unappreciated by the teacher can be conduct problems.

Inadequately challenged, bright students can also present classroom management challenges. Generally, they have "cruised" to passing grades without working hard in many of their classes. They realize that, if they are among the best readers and writers, they are likely to earn the best grades. Boredom is a familiar state, especially when the teacher devotes extra time to working with the slower students. Typically, the fast learners assist the slow learners, or they do busy work designed to keep them occupied while the slow learners get more individual attention. Many fast learners resent these scenarios; they do enough to pass, and they devise ways to entertain themselves and their classmates.

To be effective, a teacher must plan units that span Bloom's hierarchy of thinking skills. Slow learners may require more time learning lower level skills involving knowledge, comprehension, and application; moving to higher levels of learning too soon causes frustration. A student might give up. Fast learners are able to move quickly to analysis, synthesis, and application. If too much time is spent on lower learning skills, they are likely to lose interest before attempting to master the higher levels. Research indicates that one difference between fast learners and slow learners is that fast learners tend to spend more time on tasks (Shrimron, 1973). Both fast and slow learners benefit by being allowed to learn at their own paces.

Moreover, the teacher has to compete with the accoutrements of our technological society for the interest of the student. It is well-publicized that children who have grown up with electronic games, cellular phones with text messaging, digital cable television, compact discs, mp3, and other accessories are demanding in their appetites for entertainment. The teacher must

somehow draw their attention to the subject matter being taught; it must be made interesting for the students. It seems that the teacher must incorporate technology into the classroom activities and/or do something that students find equally interesting as technological devices.

Teachers must find a way to reach students who learn in different ways according to Gardner's multiple intelligences: linguistic, logic-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalistic. Kinesthetic learners benefit from manipulative activities such as constructions, drawing exercises, touching and feeling specimens, and using manipulatives to model problems being solved. In 2000, after surveying almost every child in the school, it was estimated that 75% of the students attending the middle school were primarily kinesthetic learners. It may be unrealistic to expect these students to remain seated and attentive.

Individualized instruction, aimed at finding out what students already know, then teaching them what they are ready to learn next, in ways that the student is best able to learn, is considered to be a superior teaching strategy today. The idea of individualized instruction was conceived shortly after the beginning of the industrial revolution. Against the impersonalization of our industrialized society, we have placed increased value on the individual. Individualilized instruction adapts to the student's developmental level. In individualized instruction, students learn at the rate at which they are able to comprehend the concepts they're being taught. Different learning styles are accommodated. Individualized instruction can be accomplished via learning centers.

Using learning centers, or activity centers, multiple learning styles can be addressed in the same classroom in the same class period. Drawing, reading, vocabulary activities, watching a tape, and listening to a CD may all be accomplished by the same student in

science class on Wednesday, for example. So students can address their strengths and weaknesses regularly. Research shows us that individualized instruction through learning centers is efficient at helping students of different abilities to progress. My objective is to determine if use of learning centers in a high school science classroom increases student achievement. My expectation is that students will score significantly higher on a post-test than on the corresponding pre-test after learning science via a variety of teaching methods.

Learning centers are also an effective way to divide the time in classes on a block schedule. One common complaint about block scheduling is that the classes are too long for students to stay alert and attentive. If students rotate through several learning centers, they will accomplish several tasks and have less opportunity to become bored (if the tasks are well chosen). The very act of moving from one center to another is beneficial to students. Brain research tells that sitting causes blood to pool in our buttocks, the phenomenon is called livor. Dependent livor refers to the blood pooling in the lowest areas of our bodies, our feet when standing, and our feet, legs, and buttocks when sitting. The extra blood in our dependent, or lowest, areas means that there is less blood circulating in our cerebral cortex, the cognitive center of our brains. Walking, as in from one center to another, by action of the calf muscles on the veins in our legs, pushes blood upward in our bodies towards the cortex of the cerebrum. Furthermore, some centers will require movement as part of the task. There are many ways in which learning centers can improve a classroom. This study only examines the outcomes of using learning centers on achievement. The conclusions of this study can only generate more questions about learning centers.

The purpose of this research was to determine whether using a variety of teaching methods as a student teacher would prove effective in improving scores on an objective biology test. Methods will include hands-on activities, laboratory investigations, demonstrations, lectures, directed reading, crosswords, word searches, problem-solving activities, class discussions, and questions requiring short answers (paragraphs). Whole class instruction was alternated with cooperative learning. It is expected that the high school students will exhibit growth by scoring significantly higher on a post-test than on the corresponding pre-test.

Data Collection and Results

This Hamilton County, Tennessee high school has a science and mathematics magnet program and is located in an urban setting. It draws students from all over Hamilton County to its magnet program, and from the surrounding neighborhood, as well. By last census, there are 510 students: 182 ninth graders, 148 tenth graders, 98 eleventh graders, and 87 twelfth graders. Fifty-six percent of the students are male; 69% are Black, 28% are White, 3% are Asian, and 1% are Latino/Chicano. Student attendance and promotion rates are both respectable at 93% and 88%, respectively. Free lunch is received by 38% of students, while 9% of students receive lunch at a reduced price, based on household income. This study involves 13 students taking a Biology II elective. No incentives will be offered to students for participating in this study.

This study was conducted using groups of 10^{th} through 12^{th} graders. The individual strengths of the students may be taken advantage of by using a variety of teaching strategies, thus touching on a variety of learning styles. Dissections were done weekly: starfish, grasshopper, mullet (fish), frog, and snake. Virtual dissections were available for queasy students or students who wanted to review anatomy without taking out their specimen. Dissections were usually done in cooperative groups of three to four. Documentary videotapes were available for

viewing, accompanied by videotape review sheets. The review sheets direct the students' attention to the title, author, main theme, facts, and new vocabulary of the videotape watched. Word searches and/or crossword puzzles were done weekly in order to reinforce vocabulary. Students created most of the word searches so that they could read and write the words an additional time. Students also completed directed reading and critical thinking activities on a weekly basis. An archive *Science Friday* show about cosmetic products polluting aquatic environments was downloaded from National Public Radio and played for the class. Students generally worked at their own pace, and went to successive activities in their own time. Toward the end of the placement, the Biology II class visited the Tennessee Aquarium while studying fish and amphibians, thereby enriching and reinforcing the objectives.

The Hamilton County and State Standards covered were general in nature:

> **2.6** Examine the effect of human activity on ecosystems.
> **5.2** Infer the types of organisms native to specific environments included in the major biomes present on earth.
> **5.3** Integrate a comparative study of plant and animal anatomical structures so as to recognize relationships among organisms relating to structural components, symmetry, metamorphosis, and alteration of generations (HCDE, 2004).

The specific objectives outlined in the textbook were:

- Describe the key characteristics of reptiles.
- Relate a reptile's ectothermic metabolism to its activity level.
- Summarize the adaptations that enable reptiles to live on land.

Participating students were be given a pre-test covering the objectives for reptiles.

Participating students were given a pre-test covering the objectives for reptiles. The test was scored. The student teacher covered the objectives using a variety of methods including demonstration, lecture, laboratory investigation, hands-on activities, directed reading, class discussion, short answer questions, and critical thinking activities. A post-test was administered,

covering the same objectives and using the same types of questions. When the pre-test and post-test scores were compared, significant improvement was expected on the post-test. Item analysis revealed what types of items were most often missed on the post-test. It was expected that objectives that were covered using hands-on activities, among other methods, would be the activities that were most often answered correctly.

Twenty-four questions were selected from the textbook publisher's Exam View disc. They were the 24 multiple-choice questions that were available for the sections on reptiles. These questions were typed into a quiz on the instructor's website at Quia.com (n.d.). The mobile computer lab was reserved so that students log in on Dell notebook computers. Students click on *Student Zone,* then on *Take a Quiz*. The quiz comes up in its entirety, with 20 out of 24 questions, in random order. Students select their responses to the type 1 (type A) questions by clicking the bubble at the left of the statement. Students may go back and change answers until they click submit after the 20th, and last, question. The test is scored automatically and immediately. The results, shown to the students, are archived for the instructor. Quia makes it easier to complete a question-by-question analysis. Pre-tests and Post-tests were administered using this method.

The privacy of the subjects is preserved. Access to assessment data is restricted to persons who ordinarily have that access: the individual students and their parents or guardians, the academic team, and the administrators. Previous assessments may be used to aid the academic team in meeting the students' needs, but that information would not be relevant to the study, and will not included in the data for the study. Study participants remain anonymous, as numbers are used to identify them in all reports related to the study.

Students who participate in the study will be exposed to no more risk than they would otherwise be exposed to as high school students taking a science elective. All instruction and assessment will be based on county and state objectives; teaching methods will not be radical, but will consist of widely accepted strategies.

Results

The pre-test scores ranged from 2 to 12, out of a possible 20, with an average of 7.7 and a standard deviation of 3.2. Post-test scores ranged from 6 to 20, with an average of 13 and a standard deviation of 4.5. The table and graph reveal that all students achieved positive growth except one who answered one less question correctly on the post-test compared to the pre-test. The improvement otherwise ranged from 2 questions to 10 questions, or 10% to 50% improvement, respectively (see Figure 1).

Pre-test and Post-test Scores

Stdnt #	Post-test	Pre-test	Growth	Post-test %	Pre-test %	% Growth
1	7	5	2	35	25	10
2		11			55	
3	16	8	9	80	40	40
4	15	7	8	75	35	40
5	17	12	5	85	60	25
6	18	10	8	90	50	40
7	12	10	2	60	50	10
8	6	7	-1	30	35	-5
9	9	5	4	45	25	20
10	18	8	10	90	40	50
11	20	12	8	100	60	40
12	12	3	9	60	15	45
13	10	2	8	50	20	30
14	11	7	4	55	35	20
Average	13.1538	7.6429	5.8462	66	39	27
Stndrd Dev.	4.50641	3.1527	3.4119	22.5320285	14.56795	16.39848

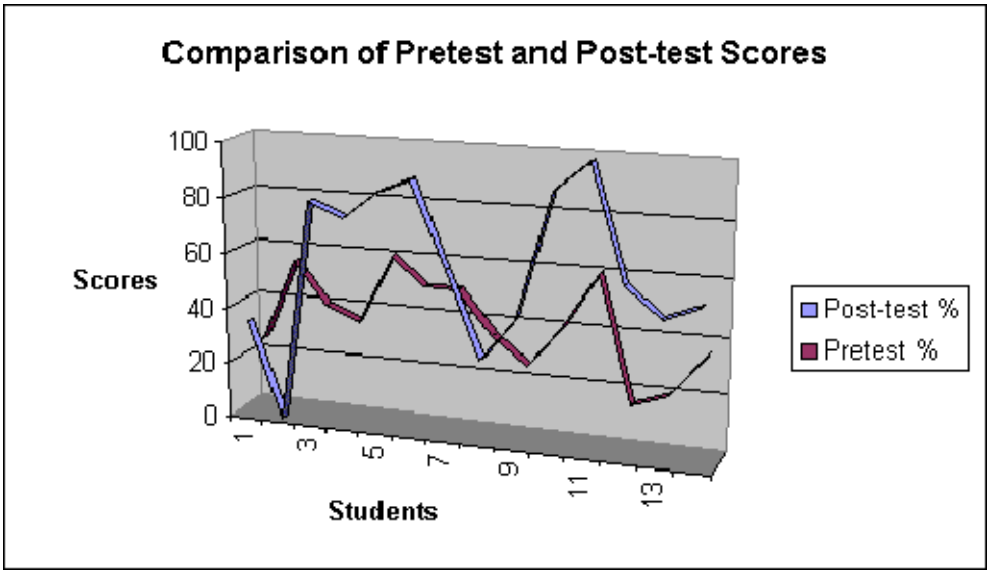

Figure 1. Pre-test and post-test scores.

The average improvement was disappointingly low at 27%, but most of the students did better on the pre-test than would be expected by chance. The pre-test average of 39%, with a high of 60%, indicates that students were somewhat prepared for the pre-test. The previous units on arthropods, fish, and amphibians prepared students to learn about reptiles. There is considerable overlap of concepts and vocabulary. Specifically, all of these classes of animals are ectothermic; reptiles and fish both have scales, and in the fish and amphibian units, we discussed he adaptations that were necessary for animals to survive on land. Questions about the ectothermic nature of reptiles and questions about the adaptations that allowed animals to live on land were most often answered correctly on both the pre- and post-tests:

Questions: 1 …snakes don't inhabit cold regions
3 …snakes bask
9 …snakes have lungs
13 …internal fertilization

14 …most reptiles have no third eye
15 …reptile eggs protect fetuses within membranes
19 …ectotherm
22. …reptiles are terrestrial
24 …reptiles' lungs are well developed

Other questions that were usually answered correctly on the pre-test and post-test included the following: that snakes have no legs, dinosaurs became extinct at the end of the Cretaceous period, snake tongues collect chemicals in the air, members of the order crocodila, the carapace of the turtle, characteristics of the tuatara, and the cloaca. The tasting and smelling of substances by collecting molecules is a fundamental characteristic of living things that was covered in life science and early on in Biology II. The term carapace is familiar to Biology II students because the some arthropods have a carapace and arthropods were covered in great detail several weeks ago. The cloaca is an organ shared by fish, amphibians, and reptiles. So many of the reptile objectives represented on the pre-test and post-test had been previously covered in other units.

Conclusions and Recommendations

While 66% on a post-test is failing, it is close to the 70% test average that the Biology II class maintained before they had a student teacher for the semester. It indicates that, although they learned some material during my time with them, I was unable to adequately take advantage of their strengths or compensate for their academic weaknesses. Three students in the class were absent more than once weekly, mostly with excused absences. During the study, two other students spent a combined 21 days in in-school suspension and out-of-school suspension for various offenses, most of which were committed outside of the Biology II classroom. As one would expect, these students score among the lowest on tests. It is always challenging to make up for absences due to students' poor health or poor conduct. This will be the focus of my next action research.

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Correlational Studies Examining the Relationships Between
The Usage of the Web Site, MathClass, Achievement on Tests, and Attitudes of Pre-Calculus Mathematics Students

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The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-029.

Introduction

In today's world, technology is being integrated into virtually every part of one's life. Education is no different. Educators need to evaluate how education is changing and what steps need to be taken to use this new tool to develop a new curriculum, if needed, to enable students to take advantage of the ever-growing use of technology. One of the newest mediums used to integrate mathematics into the classroom is Internet sites that either provides tutorials or practice of mathematical concepts to involve the student outside of the traditional classroom. Very few studies on the usefulness of this technology have been done, but most of the studies that have been done seem to indicate no significant difference in final test scores. Although this may seem to be a disappointment, there are many benefits that web-based homework, as well as web-based classes, can offer. One such benefit is the capability to provide distance courses. Distance courses offer a wide variety of classes to those students who would not be able to take these courses in the traditional way. This research paper will explore the usefulness of a specific web site, MathClass (University of Kentucky, 2001), and its usefulness for students using the interactive service. MathClass was created by researchers at the University of Kentucky to aid their students in learning various mathematical topics taught at the University. The implementation of this web site has trickled into other universities, such as The University of Tennessee at Chattanooga. Through the help of Dr. Stephen Kuhn, this researcher has been able to write the source code for seven test review assignments. These seven web documents were the focus of this study.

*St*atement of the Problem

The purpose of this study was three-fold. The first purpose was to determine the relationship between use of the web-based homework site, MathClass, and test scores of pre-

calculus students. The variables of interest were the frequency of use of the web site and the test scores of the students in the study.

The second purpose was to determine the relationship between use of the web-based homework site, MathClass, and the attitude of pre-calculus students toward learning. The variables of interest were the frequency of use of the web site and the attitudes of the students in the study.

The third purpose of this study was to determine the relationship between the attitudes and the test scores of the students using the web-based homework site, MathClass. The variables of interest were attitudes and test scores of the students in the study.

Review of Related Literature

There are several forms of technology that have been used to enhance the study of mathematics. Many textbooks now include software to allow the teacher to integrate technology into his or her normal classroom environment, but these software packages are often insufficient in allowing the teacher or professor to integrate web-based assignments into their curriculum. In researching the articles regarding web-based assignments, it became clear that very little research has been done on this subject. One of the primary questions asked when referring to technology is, “Does it improve understanding?” Wilkinson and Echternacht (1998) stated, “The specific problem addressed in the study was the lack of information concerning the impact on student learning when homework is assigned that incorporates Internet applications” (p. 218). Discussing the use of graphing calculators in the classroom, Stern, Alderfer, and Cienkowski (1998) hypothesized that there is a pivotal point to where technology is useful. Past that point, technology could become a hindrance of automation. Technology can never take the place of the instructor’s role, but it could enhance what the instructor emphasizes.

There are four areas of interest upon which this review will focus: (a) the cost of using web-based applications, (b) attitudes toward using web-based applications, (c) time spent on the applications, and (d) the performance of the students who use the web-based applications.

Cost of using web-based applications begins with the training of teachers to use and implement the technology. Without proper training, the integration of technology into the traditional classroom would become pointless. Cost is very important when focusing on the idea of distance learning. Ryan (2002) established that there seemed to be no significant difference in his study of a traditional lecture-based course, a telecourse, and a web-based course. If this were the case, the use of web-based delivery would allow universities to reach out to students who would possibly never have the opportunity to take certain classes. In this sense, the cost of having students enroll in a web-based class is much less than the cost for establishing a class in a rural area where there may be only a few students who would take the class.

Attitudes of students using technology can have a very beneficial impact on how the student feels toward the subject he or she is studying. A very important finding between Internet homework and traditional homework was that student attitude was not affected by the use of Internet homework (Wilkinson & Echternacht, 1998). Many could argue that, without establishing the fact that student perceptions would not differ from students in the traditional classroom, any study would be futile. Using technology in any subject should not have a negative attitudinal impact on the subject. Otherwise, the use of the technology would be hurting the overall experience of the students. Ryan (2002) echoed this in his findings. When observing student achievement, measured by student attitudes, Ryan found no significant difference in the achievement of those students using web-based lecture and those students using traditional lectures.

When discussing attitudes of students, it is also important to know the feelings of those who are implementing the technology into the classroom. Hazzan (2000) found that prospective teachers thought learning with computers could be beneficial, but many of the prospective teachers had more arguments against the use of computers than arguments that supported the use of computers.

Time is a precious commodity for students of all ages. With growing responsibilities, many students find themselves without the proper time to complete all of their assignments thoroughly. With this in mind, a very important finding came from the study on Internet homework assignments by Wilkinson and Echternacht. Wilkinson and Echternacht (1998) found that there was a significant time difference for the completion of assignments between those students who used the web-based homework assignments and those students who used traditional assignments. The students who used traditional homework activities took an average of 90.92 minutes to complete the assignments, where as the students who used web-based homework activities took an average of 142.61 minutes to complete the assignments. This was a significant drawback to their study's findings. Technology must be integrated into the curriculum some way that does not hinder the student's allocation of time. If not, students will simply not use this tool to better their understanding of the material.

The last item of interest was the aspect of performance due to the use of web-based offerings. For most students and teachers, the test score is the most important factor in any type of delivery. With any type of delivery, the teacher is trying to convey their knowledge of a given subject to the student. They look to tests as to whether a student has achieved that transfer of knowledge. Wilkinson and Echternacht (1998) discovered that their study did not have a significant impact on student performance. Rather, there seemed to be no significant difference

between traditional homework activities and web-based homework activities when considering achievement (Wilkinson and Echternacht, 1998). Ryan's study (2002) supported the claim that there appeared to be no significant difference in scores between traditional lecture method and those methods using technology. In another study of web-based instructional modules by Bailey, Hall, and Cifuentes (2001), there did seem to be a finding that the web-based modules did indeed contribute in a positive manner. In the latter study, Bailey et al. also identified what type of learner seemed to benefit the most from the web-based modules used in the study. They found that the self-motivated student had a greater success with the online modules than those students who were not self-motivated. They discovered that self-motivated students worked on the web-based quiz modules more often, which in turn helped them on the in-class tests.

In reading these related articles, there did seem to be some points that all of the research concluded. In all studies, there was not a negative effect on achievement scores of those students who used some form of web-based technology. The results from the studies also indicated that there was no significant difference between the attitudes of those students who used technology and those students who were in the traditional classroom.

The cost factor was a very strong argument for using web-based material. Much more information can be shared over the Internet, which allows educators to reach more students at a fraction of the cost of a traditional class. However, it is important to look at the time factor as a consideration to whether a web-based activity is usable. Wilkinson and Echternacht (1998) discovered that there was a significant difference in the time that was spent on the web-based homework activities as compared to traditional assignments. This should cause some concern for future researchers. If technology will be used to enhance the study of a topic, there should be no negative drawbacks to the use of technology.

Statement of hypothesis

There are three hypotheses to this study.

1. Is there a correlation between the frequency of use of the web site, MathClass, and student achievement?
2. Is there a correlation between the frequency of use of the web site, MathClass, and student attitude toward using the web site, MathClass?
3. Is there a correlation between student attitude toward using the web site, MathClass and student achievement?

Methodology

Participants

Participants for this study were 28 eleventh-grade and twelfth-grade mathematics students enrolled in a pre-calculus course called Math 4. All students had access to the Internet, as required by the school. The participants were enrolled an all-male, private high school in Chattanooga, TN. The entire population of the Math 4 students enrolled in the researcher's sections was chosen to insure good results.

It has been said that boys have a more positive attitude toward Mathematics than girls. This could be construed as a bias of the study if the study is used to draw conclusions about both genders. Males tend to like mathematics more and have a better attitude towards learning mathematics than do girls (Shashaani, 1995). Since the population is comprised of all males, the researcher should expect strong results with respect to attitude toward mathematics. It is necessary that the reader understand that the research will only be used to draw conclusions about an all-male population and not for both genders. The school is on the semester system.

Instrument

The researcher used a survey to measure attitude of individual subjects (see Appendix A). The survey was used to measure the usage of the web site, MathClass. The survey used a Likert scale to gather the information. The subjects were instructed to keep a running count of how many times they used each chapter review assignment from MathClass. After seven review assignments, the survey was employed. Students were reminded often to remember how many times they were using the web site.

To measure the validity of the survey, the researcher employed content validity to confirm the survey validity (Gay & Airasian, 2000). This was done through peer evaluation of the survey by a panel of instructors and administrators. To insure the reliability of the survey, the researcher used stability reliability, or test-retest reliability, to measure the reliability of the survey (Gay & Airasian, 2000). The coefficient of stability for the survey was $r = .9766$. Since the students were instructed to remember how many times they were using the web site, this correlation should have been expected. The researcher did feel the survey was valid and that the information obtained from the survey was reliable.

Design

The three variables of interest were student score on in-class tests, student usage of the homework web site, and student attitude toward the use of the website, MathClass. From the subjects' survey data, information concerning usage and attitudes was gathered. The researcher used Pearson *r* to correlate most of the information. Some basic information found was the mean score of each test, as well as the mean score of the sample group, which is the group of students who actually worked the web-based assignment. The mean of the non-sample group, the group of students who did not work the web homework for a specific test, was also found.

The researcher first correlated the information comparing the students' MathClass usage to achievement on in-class test scores. Then the researcher compared the usage of MathClass to student attitude towards using MathClass. The researcher then compared student attitude toward the use of the homework web site to achievement on the in-class tests.

Procedure

The researcher began writing the source code for the web-based homework assignments in June of 2003 and continued to write the source code until January of 2004. The web site was designed to ask questions dealing with various math topics specifically designed by the instructor (see Appendix B). Chapter 1, Linear Relations and Functions; Chapter 3, The Nature of Graphs; and Chapter 4, Polynomial and Rational Functions were completed during the summer of 2003. Chapter 11, Exponential and Logarithmic Functions; Chapter 12, Sequences and Series; Chapter 5.1-5.5, The Trigonometric Functions; and Chapter 5.6-5.8, Law of Sines, Law of Cosines, and Area of a Triangle were created during the fall of 2003. The web site was designed to give immediate feedback to the student after he completed the homework assignment. It also gave the student an opportunity to send email to the instructor with any question he may have had. At the beginning of the 2003-2004 school year, students enrolled in the researcher's pre-calculus course were told of the MathClass web site as an additional tool to review for tests in the course. They were also asked to keep a record of how often they used the web site. With this in mind, the researcher continued to post homework assignments throughout the school year. After seven tests, the researcher asked the students to fill out the survey of usage and attitudes on March 1st. He gathered data from this survey and then re-administered the survey 2 weeks later to confirm the reliability of the survey. Appropriate consent forms from the subjects, as well as from the parents of the subjects, were obtained.

Limitations of any research study are usually as important as the findings of the study. There were five major limitations to this study:

1. The first limitation was the population itself. An all male population limits the research to only male students. There can be no conclusions concerning female students.
2. Another limitation was the possibility of faulty records the students may have kept during the year. Students may have simply written down information on the survey that was not accurate.
3. The third limitation was that some students did not fully use the web site as it was designed. Many students simply printed out the web-based assignment and then worked on the problems. By doing this, they did not know the correct answer to each problem.
4. The fourth topic of concern was the size of the population. Twenty-eight students is relatively small sample group and the findings of this study cannot be generalized for the entire population of male pre-calculus students.
5. The length of the research period was a major limitation to this study. This research would benefit from a longer period in which more information could be analyzed.

Data analysis and results

Results

Many ideas emerging from the data gathered from this research were proven useful. The test average of each test and the test average of both the sample group and the non-sample group, are presented in figure 1. While most of the sample group's averages seemed slightly higher, no correlation can be drawn from this observation. All averages are rounded to one decimal place.

	Ch. 1	Ch. 3	Ch .4	Ch. 11	Ch. 12	Ch. 5.1-5.5	Ch. 5.6-5.8
Complete Population Average	91.5	75.9	82.5	86.6	73.5	84.9	85.1
Sample Average	93.6	80.5	82.4	86.5	75.3	86.25	88.3
Non-sample Average	90.8	71.9	82.7	87	71.4	83.9	82.7

Figure 1. Test averages.

In looking at the correlation between the number of times that each individual used MathClass and each individual's test scores, there seemed to be no significant correlation. A linear regression, in the form ax + b, was performed with the number of times that each individual used MathClass and each individual's test scores for each chapter in the study. The results for chapter 1 revealed "a" to be equal to 1.941, while "b" equaled 90.807. The Pearson "r" correlation coefficient was .254. For chapter 3, "a" equaled 9.111 while "b" was 71.3. The Pearson "r" coefficient for chapter 3 was .383. This correlation coefficient was the highest correlation of any of the chapters. The remaining results for each individual chapter can be found in Figure 2. Only data from the students who used the Internet web site were used in these calculations.

ax + b	Ch. 1	Ch. 3	Ch. 4	Ch. 11	Ch. 12	Ch. 5.1-5.5	Ch. 5.6-5.8
a =	1.941	9.111	1.824	.773	2.823	.548	3.308
b =	90.807	71.3	80.972	85.787	71.484	84.576	83.063
r =	.254	.383	.134	.055	.103	.048	.266

Figure 2. Usage vs. test scores.

As the reader can see, the results from the correlation between the usage of MathClass and scores revealed no significant correlation.

The results from the second study, the correlation between student usage of the homework web site and each individual student's attitude toward using the web site, revealed

slightly higher numbers, but, again, there appeared to be no significant correlation between the two variables. A linear regression, in the form ax + b, was performed with the number of times that each individual used MathClass and each individual student's attitude toward using the web site. The results are listed in Figure 3. Only data from the students who used the Internet web site were used in these calculations.

ax + b	Ch. 1	Ch. 3	Ch. 4	Ch. 11	Ch. 12	Ch. 5.1-5.5	Ch. 5.6-5.8
a =	.077	.833	.083	.469	.25	.429	.763
b =	4.46	3.333	4	3.656	3.8	3.690	3.169
r =	.113	.386	.049	.382	.241	.525	.589

Figure 3. Usage vs. attitudes.

With the chapter 5.1-5.5 homework assignment and chapter 5.6-5.8 homework assignment, there seemed to be a stronger correlation between the variables, but the other chapters in the study revealed no significant correlation. The review assignments covering chapter 5 may have had a significant impact on the student attitude because of the difficulty of the material. With this difficult material, which covered various trigonometric topics, students may have had a more positive attitude towards the test because they felt better prepared for these tests. The sample group's average for each of these tests was significantly higher than the non-sample group test average for each test (see Figure 1).

The results from the third study, the correlation between student attitude toward using the web site and the individual test scores of each individual student, revealed the strongest correlation between the two variables, but there appeared to be some other factor affecting the results. The results were inconsistent throughout the chapters analyzed. A linear regression, in the form ax + b, was performed with each individual student's attitude toward using the web site and the test scores of each individual student. The results are

listed in Figure 4. Only data from the students who used the Internet web site was used in these calculations.

ax + b	Ch. 1	Ch. 3	Ch. 4	Ch. 11	Ch. 12	Ch. 5.1-5.5	Ch. 5.6-5.8
a =	2.75	14.304	.179	10.625	3.023	2.357	5.242
b =	81	19.946	81.708	39.5	62.837	76.036	65.97
r =	.332	.578	.012	.701	.112	.151	.543

Figure 4. Attitudes vs. test scores.

These results seemed to indicate a stronger relationship between these two variables, but the results were, again, inconsistent throughout all the chapters. For the review assignments covering chapters 1, 3, 11, and sections 5.6-5.8 of chapter 5, the correlation was much higher than the rest of the chapters. A contributing factor for this increased correlation may have been the material covered in these chapters. Students who used the homework web site may have had a more positive attitude toward the test, which may have influenced their final test score.

Conclusions and Recommendations

After examining the data from the study concerning the relationship between usage of the homework web site and test scores of the students, the researcher concluded that, even though there was a slight elevation in the sample groups' average test score over the non-sample groups' average test score for most of the web-based review assignments, no significant correlation existed between the two variables. This was consistent with most of the findings from the previous studies that were reviewed.

With the second correlation study, that focused on the relationship between the usage of the Internet homework web site and the students' attitudes towards learning the material, there seemed to be a moderate correlation between the two variables only in the review assignments covering chapter 5. There was a slight correlation between variables with chapter 3, but this correlation, along with the findings of the other chapter review assignments, tends to indicate

that there was no consistent correlation throughout the study. This finding was consistent with reviewed studies that indicated that there appeared to be no significant impact on attitudes of students who used the homework web site.

For the third study, involving the attitudes of the students and the test scores of the students, there did appear to be a stronger relationship between these two variables, but these results did not reveal a dramatic relationship. If there was a consistent correlation between attitudes and test scores throughout the chapter review assignments, then it could be concluded that the attitudes did indeed affect the test scores positively. With the results as they were, this researcher surmised that, overall, there was no strong correlation between these variables, as well. This was consistent with most of the findings from the previous studies that were reviewed.

With most studies involving education, there seems to be long-term goals with each study. Because this research study had so few subjects, it would be beneficial to increase the population size in order to collect data that may have had a more decisive outcome. Increasing the size of the population would be crucial to understand how any two of these variables affect each other. Along with this idea, it would serve the researcher well if the duration of the research was extended throughout one entire school year or, perhaps, a series of years. This would also help clarify whether there exists any relationship between any of the two variables. The method of data collection from this study needs to be addressed in order for the researcher to feel confident that the data collected is the true data for each individual subject. If the data collected is data from subjects who simply write what he or she feels the researcher is wanting, the data becomes useless. A more precise method of recalling the number of times a student uses the homework web site needs to be found to insure the data is the actual data from each subject.

The data analyzed from this research study indicated that there was no significant correlation between the usage of the homework web site, MathClass, student attitude, and student achievement. This research does not imply that the use of the web site has any negative effect in learning the material covered in the web-based homework assignments. Students often commented that the biggest benefit the web-based assignments offered was that it allowed the student to see how the instructor would ask the questions that would appear on the tests. Getting used to the style of questions and the use of the terminology embedded in each question does provide a useful tool for each and every student.

Appendix A: Math 4 Survey of the Usage of MathClass

Math 4 Survey of the usage of MathClass

Information from this survey will be used evaluate Mr. Lyons' math 4 sections. It will be used only in statistical form with no reference to individual students. In particular, no information from this survey will have any bearing on your grade in this or any other course.

NAME: _____

1. How many times did you do a full review assignment on MathClass for review for Chapter 1?

    A. Never
    B. Once
    C. Twice
    D. Three times
    E. More than three times

ANSWER: _____

2. Did you find the review assignment for chapter 1 useful?

    A. It hurt in preparing for the test
    B. Not at all
    C. Slightly helped
    D. Moderately helped
    E. Significantly helped

ANSWER: _____

3. How many times did you do a full review assignment on MathClass for review for Chapter 3?

A. Never

B. Once

C. Twice

D. Three times

E. More than three times

ANSWER: _____

4. Did you find the review assignment for chapter 3 useful?

A. It hurt in preparing for the test

B. Not at all

C. Slightly helped

D. Moderately helped

E. Significantly helped

ANSWER: _____

5. How many times did you do a full review assignment on MathClass for review for Chapter 4?

A. Never

B. Once

C. Twice

D. Three times

E. More than three times

ANSWER: _____

6. Did you find the review assignment for chapter 4 useful?

A. It hurt in preparing for the test

B. Not at all

C. Slightly helped

D. Moderately helped

E. Significantly helped

ANSWER: _____

7. How many times did you do a full review assignment on MathClass for review for Chapter 11?

A. Never

B. Once

C. Twice

D. Three times

E. More than three times

ANSWER: _____

8. Did you find the review assignment for chapter 11 useful?

A. It hurt in preparing for the test

B. Not at all

C. Slightly helped

D. Moderately helped

E. Significantly helped

ANSWER: _____

9. How many times did you do a full review assignment on MathClass for review for Chapter 12?

A. Never

B. Once

C. Twice

D. Three times

E. More than three times

ANSWER: _____

10. Did you find the review assignment for chapter 12 useful?

A. It hurt in preparing for the test

B. Not at all

C. Slightly helped

D. Moderately helped

E. Significantly helped

ANSWER: _____

11. How many times did you do a full review assignment on MathClass for review for Chapter 5.1-5.5?

A. Never

B. Once

C. Twice

D. Three times

E. More than three times

ANSWER: _____

12. Did you find the review assignment for chapter 5.1-5.5 useful?

A. It hurt in preparing for the test

B. Not at all

C. Slightly helped

D. Moderately helped

E. Significantly helped

ANSWER: _____

13. How many times did you do a full review assignment on MathClass for review for Chapter 5.6-5.8?

A. Never

B. Once

C. Twice

D. Three times

E. More than three times

ANSWER: _____

14. Did you find the review assignment for chapter 5.6-5.8 useful?

    A. It hurt in preparing for the test

    B. Not at all

    C. Slightly helped

    D. Moderately helped

    E. Significantly helped

ANSWER: _____

Appendix B: Copy of MathClass Assignment

Chapter 11 test review problems

Please answer all questions completely. Be aware of syntax that must be used for some answers. You may have more than one answer on

some of the problems. Unless otherwise stated, you should approximate any answers to TWO decimal places. Do not change the variables

in the problems. You must include a multiplication symbol between any number and variable, i.e.- 2x must be written as 2*x.

Some notation to be aware:

"sqrt" is square root. example: sqrt(19)= $\sqrt{19}$

Question 1

The half-life of the radioactive isotope Cesium-137 is 30 years. If there are 80 grams of Cesium-137 at present, when will there be 27 grams left? [ ] **years**

Question 2

Solve for the exact value of x: $\log_7(x) = -\frac{2}{3}$ [ ]

Question 3

What principal invested at 4% compounded continuously for 5 years will yield $610.60?

Round your final answer to the nearest penny.

The answer is $ [ ]

Question 4

Solve for the exact value of x: $\log_{16}(x) = -\frac{3}{4}$ [ ]

Question 5

Solve for x: $7^{(x-2)} = 8^{(x-1)}$

x=

A. 11.87306329

B. 7.

C. -13.57267917

D. 16.57267917

( ) A ( ) B ( ) C ( ) D

Question 6

Evaluate $\left(3x \left(\frac{1}{2}\right)_y (-2)_z \left(\frac{5}{4}\right)\right)^{(-4)}$. The simplified answer with no negative exponents is:

A. $\frac{81x^2z^5}{y^8}$

B. $\frac{1y^8}{81x^2z^5}$

C. $\frac{81y^8}{x^2z^5}$

D. $\frac{81x^2z^5}{y^8}$

A B C D

Question 7

John smith started his first job right out of college at the age of 22. He decided to open an IRA account and contribute 200 dollars a month to the account. He hopes the IRA will average 5.00% a year(APR) over the next 40 years. If this is the case, how much money will John have in his account after these 40 years of saving? Round to the nearest penny.

Question 8

To the nearest penny, how much money will be in an account if $500 is compounded monthly for 40 years with an A.P.R. of 6%?

Question 9

A family is going to buy a house valued at $150000. The bank has an annual percentage rate of 7.00% interest for a 30 year mortgage. To the nearest penny, find the monthly payment that the family is going to pay.

Question 10

A family is going to buy a house valued at $150000. The bank has an annual percentage rate of 7.00% interest for a 30 year mortgage. To the nearest penny, how much interest will the family pay over the 30 year loan? [ ]

Question 11

Solve for x: $\log_2(x) = 3$

x=

A. $\frac{1}{8}$

B. 9

C. 8

D. $\frac{1}{9}$

A B C D

Question 12

Solve for the exact value of x: $57 = 3e^{\left(\frac{2x}{25}\right)}$

x=

A. $\frac{25\ln(3)}{2}$

B. $\frac{100 \ln(19)}{3}$

C. $\frac{25 \ln(19)}{2}$

D. $\frac{100 \ln(8)}{19}$

A B C D

Question 13

Solve for the exact value of x: $3^{(x-2)} = 5^{x}$

x=

A. $\frac{3 \ln(2)}{\ln(2) - \ln(5)}$

B. $\frac{3 \ln(5)}{\ln(5) - \ln(2)}$

C. $\frac{2 \ln(3)}{\ln(3) - \ln(5)}$

D. $\frac{5 \ln(3)}{\ln(3) - \ln(2)}$

A B C D

Submit and Record *Reset Button*

In case of technical difficulties, please

The Button will return you to Submit a Help

Back

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Pre-test/Post-test Learning Assessment of *The Great Gatsby*

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The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-018.

Pre-test/Post-test Learning Assessment of *The Great Gatsby*

Introduction

The evaluation of a pre-test/post-test learning assessment is the focus of this project. The topic selected was the study of *The Great Gatsby* in a public, urban, eleventh-grade English class. The topic was selected because the book was the next piece of literature to be studied in the class. This topic is not currently a national, state, or local issue. The study of *The Great Gatsby* is a staple of the English curriculum.

Review of Literature

English is part of the standard or core curriculum in every state in the country. Every student must become proficient in English (grammar and literature) in order to graduate. Knowing this, teachers have a strong desire to help shape English standards. Therefore, English standards play an important role in developing young minds throughout the nation (Milner, 1997).

Most teachers of English welcome developing English standards that are nationwide (Wiley & Hartung-Cole, 1998). While teachers eagerly await these nationwide standards, there is much disagreement about exactly how to go about creating them. The National Council of Teachers of English (NCTE) strives to bring teachers, parents, and students in on the process of developing these national standards (Milner, 1997).

Central to the success of all students is the quality of instruction of the teachers in the classroom. Preparing teachers to teach English is an important task. Creating student-centered classrooms is by far the most crucial element in education for teachers today (Shuman, 1996). Even with more highly qualified teachers in the classroom, there is still much diversity in the amount of learning taking place. Students in public schools spend an average of 1 3/4 hours per week on English homework outside of school. However, students in private schools spend an

average of 2 1/2 hours per week on English homework outside of school (Gamoran & Carbonaro, 2002).

Evaluating every student's performance on a regular basis is very important. It is of the utmost importance to choose a method that is as accurate as possible. With respect to the discipline of English, a pre-test/post-test is very reliable in determining a student's progress (Gliner, Morgan, & Harmon, 2003). As long as there is an adequate amount of time between testings, the results are considered valid (Teisl, Boyle, McCollum, & Reiling, 1995).

Data Collection and Results

Data was collected prior to the teaching of the unit on *The Great Gatsby*. Students completed the pre-test without any help from me, the student teacher, or any other source. The pre-test consisted of 60 matching, true/false, and multiple choice questions. After teaching the unit, the students completed the same test, now called the post-test, without any help from me, or any other source.

The pre-test showed that knowledge about the book, *The Great Gatsby*, before instruction was not very high. Figure 1 shows the percentage correct by the class. The mean score of all the students was 36.35% where a perfect score was 100%. All of the students failed the pre-test. The lowest score was a zero and the highest score was 62% correct. All of the pre-test scores indicated that the students needed a lot of instruction. An introduction to the book and an in-depth analysis followed the pre-test.

The post-test showed the mean improvement of the students was 23.09. Figure 2 shows the percentage correct by the class. The overall mean score of the students on the post-test was 59.44% where a perfect score was 100%. Upon scoring the post-test, it was found that scores

ranged from 23% correct to 85% correct. Four students did worse on the post-test than they did on the pre-test.

Conclusions and Recommendations

The evaluation of this pre-test/post-test assessment of *The Great Gatsby* shows that there was substantial improvement of students' knowledge between the pre-test and post-test. The pre-test showed a complete and utter lack of knowledge about the book. Following instruction, the level of knowledge was greatly increased. In general, students benefited from the instruction because knowledge was gained and retained over a period 2 1/2 weeks.

The National Council of Teachers of English (NCTE) says that it is vital to the content area to continue trying new methods of teaching English. A multitude of teaching strategies exist to assist teachers with the difficult task of reaching each and every student in the classroom (Milner, 1997). No one is more committed to helping children than teachers and this is a trend that will continue indefinitely.

As far as teacher professional development is concerned, it would greatly benefit teachers to get more hands-on experience and training. More observations and interactions with other teachers in the same field would be of great help in the long run. This would help with discipline, teaching strategies, and classroom management. Fortunately, grant money is available to support further research in this area. There is money available locally and federally. If used appropriately and correctly, technology will always be an important asset to the teaching of English. Software, such as Word, PowerPoint, and Excel, are already readily available in most classrooms. Soon, there may be Smartboards available in the classrooms. The opportunity for advancement with technology is seemingly limitless.

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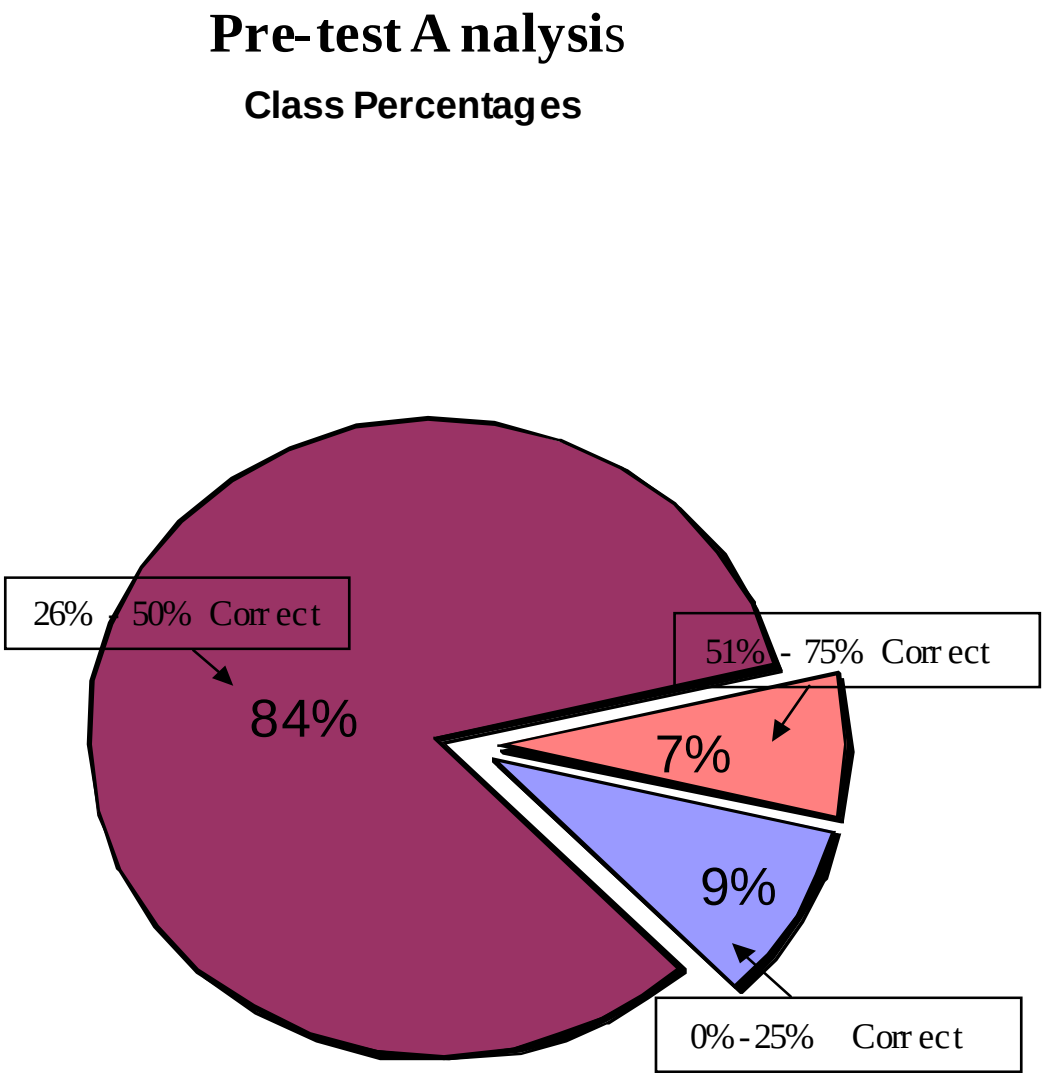

Figure 1. Chart of the results of *The Great Gatsby* pre-test.

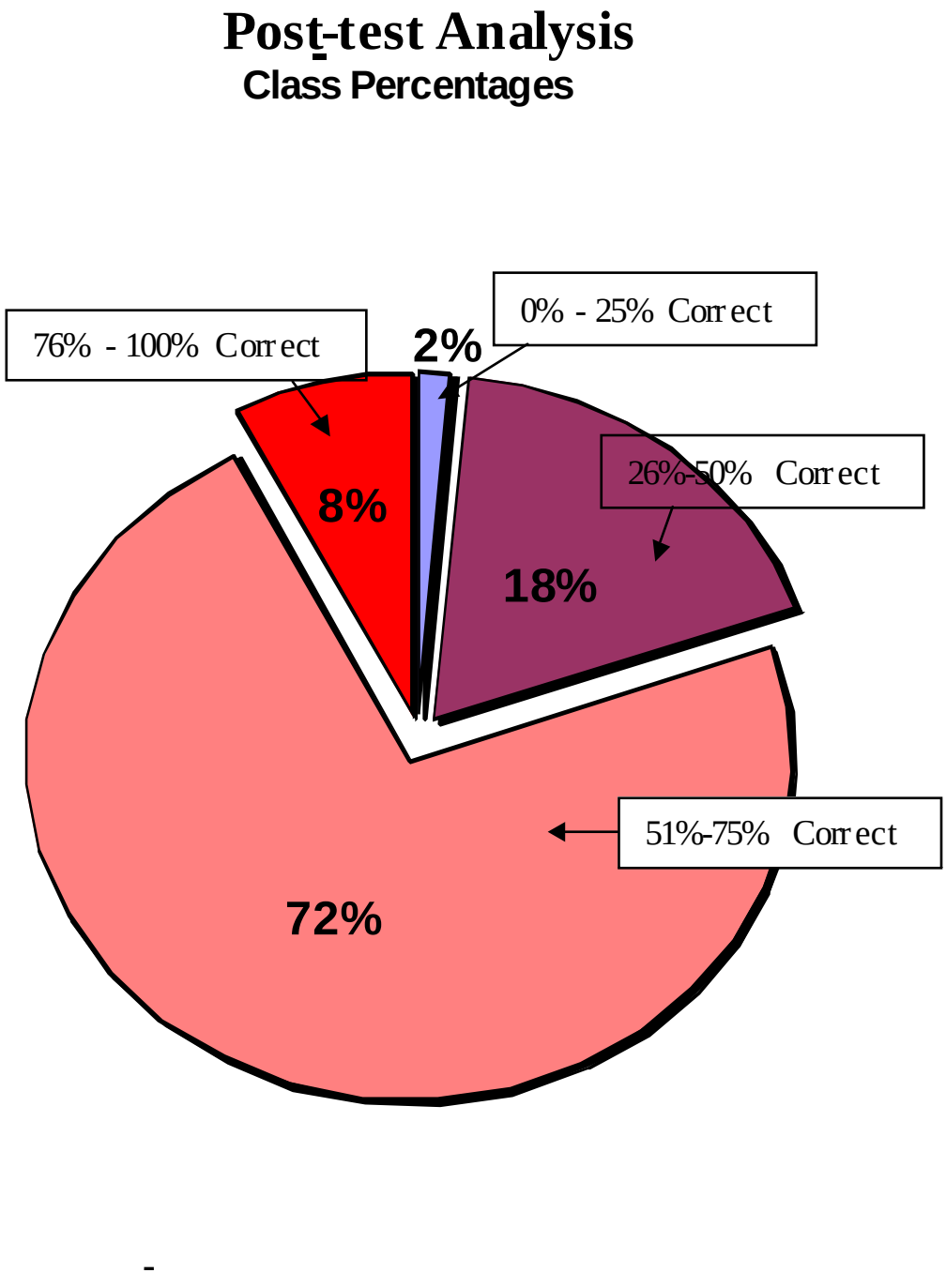

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Figure 2. Chart of the results of *The Great Gatsby* post-test.

An Examination of Supplemental Educational Services in a Targeted, Assisted, Title I School

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The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-047.

Introduction

Passed by an overwhelming majority in Congress in 2001 and signed into law by President Bush in January 8, 2002, the No Child Left Behind Act represents the most sweeping change to the Elementary & Secondary Education Act (ESEA) since it was enacted in 1965.

Building upon a foundation of accountability for improving student achievement, increased flexibility and local control, expanded parental options, and date-driven, research-informed instruction, No Child Left Behind aims to achieve a lofty goal that no society has ever attempted: a quality education for all of our students by the 2013-2014 school year.

No Child Left Behind is a law that operates on one basic assumption: that every child—regardless of income, gender, race, ethnicity, or disability—can learn, and that every child deserves to learn. It is the belief that no child should be left behind, and that all of our efforts toward reforming our schools must be focused on ensuring that student achievement and learning improve.

Under No Child Left Behind, teachers will have the training and resources they need to teach effectively; parents will have unprecedented options and resources for helping their children; schools will have the information they need to strengthen their weaknesses and put into practice methods and strategies backed by sound, scientific research; and systems will have greater flexibility in the use of federal education funds:

- Adequate yearly progress (AYP) is a series of performance goals that every school, local education agency (school system, herein referred to as LEA), and state much achieve within time frames specified in law in order to meet the proficiency goal of the federal No Child Left Behind Act.

- AYP applies to all public schools and 181 schools system in Georgia, including Title I and non-Title I schools and schools with special populations.
- All 50 states will determine AYP for both Title I and non-Title I schools for the first time before the 2003-2004 school year. Non-Title I schools must meet AYP for No Child Left Behind, but they are not subject to the rewards or sanctions under Title I.

In order to highlight the relative achievement levels of certain groups of students and hold schools accountable for closing any achievement gaps, the law requires every school, school district, and state to sort ("disaggregate") the average test results by racial/ethnic category, disability, limited English proficiency, socioeconomic status, migrant status, and gender.

Georgia uses the Criterion-Referenced Competency Tests (CRCT) as the AYP assessment tool for the elementary and middle school grades, and the Georgia High School Graduation Test (GHSGT) for high school.

It is my experience this year in providing supplemental services in reading that inspired the research. The school I work for did meet its AYP but is a targeted, assisted, Title I School. The funds provided have to be spent on supplemental services to close the achievement gap of targeted students.

In both a school-wide program and a targeted-assistance program, all low-income students are eligible but we decided to focus services on the lowest-performing students in particular grades. In other words, in a targeted-assistance school, eligibility does not depend on whether the student is receiving Title I services.

The research, data collection, and conclusions herein will comment on the data-driven, research-informed instruction. First, a review of the literature provides information on the effective, research-based instruction for reading and what researchers say needs to be done to

effectively teach children to read. Second, a review of data collected from my experiences with the students will provide information on levels of improvement in reading, based on pre-test and post-test results. Finally, the research is concluded as the literature review and data collection are brought together to examine whether the after-school tutoring (supplemental services) is effective in improving student achievement.

Review of Literature

Research overwhelmingly reveals that the early childhood years are the single most important period of time during which literacy development occurs in a person's life (National Association for the Education of Young Children, 1998; Slegers, 1996.). However, philosophical and methodological differences exist regarding how best to instruct and encourage young children to read. Teaching reading to young children in America has always been an area of controversy and debate (Teale & Yokota, 2000), and it remains so today. The purpose of Lin Lin's (2001) article is to review various studies and to identify essential elements of effective early literacy classroom instruction.

According to the National Institute for Literacy (2001), phonemic awareness is the ability to think about and work with individual sounds in spoken languages. Before children learn to read, they need to be aware of how sounds work. Teachers should integrate phonemic awareness instruction in the curriculum to help children learn to read and spell. The instruction can start with having children categorize the first phonemes--the smallest functional unit of speech--in words and then progress to more complicated combinations. According to the National Reading Panel (2000), "Phonics skills must be integrated with the development of phonemic awareness, fluency, and text reading comprehension skills." Developing skill in blending and manipulating

phonemes has been found to permit many children to develop strong reading abilities who were otherwise struggling.

Young children's literacy learning benefits greatly from adults who are responsive to their interests and sensitive to their current level of language development (Slegers, 1996). Young children need teachers to play with them, talk with them, sing to them, and do finger plays and other learning games with them. (NAEYC, 1998; Teale & Yokota, 2000).

The early childhood curriculum should be intellectually engaging and challenging in a way that expands children's knowledge of the world and vocabulary. Investigating real topics or events that are meaningful to children should be a primary feature of the curriculum. When children investigate, they have opportunities to ask questions and use their literacy skills to explore their worlds. Teachers can establish time each day for students to present their thoughts in symbolic ways. Children can also work in small groups with peers having different skills so they can learn from each other. Most young children are eager to learn literacy when they discover that it is useful for exploring the environment and for communicating with others (NAEYC, 1998; Neuman, 1998.)

Listening to stories and discussing them are very important activities in early childhood classrooms (Slegers, 1996). For very young children, who normally have very short attention spans, story times work best when they are short (about 5-10 minutes) and conversational.

When reading to students of all ages, teachers should speak with inflection in order to convey meanings. Teachers may either stop and ask questions when they read the books or they can read an entire passage at once, thereby permitting students to enjoy the language and the rhythm of the book (Neuman, 1998). After readings, there should be opportunities for children to

talk about what was read and to focus on the sounds and parts of language, as well as the meaning of the book (NAEYC, 1998).

Students not only need to listen to a book, they also need to have chances to read independently. Library corners need to be in the central part of the classroom, with comfortable furniture that encourages children to read by themselves. Varying levels and varieties of reading materials, such as novels, biographies, informational books, magazines, and newspaper articles, should be provided to broaden children's reading experiences. Good lighting and lively displays and readily accessible arrangements of books encourage children to stay in the library (Neuman & Bredekamp, 2000.) Opportunities for children to read to audiences, including peers, parents, or even stuffed animals, should be provided since this has been found to increase reading accuracy and fluency. When children have opportunities to experience various types of literature, such as stories, informational texts, and to learn from lessons about comprehension strategies, such as predicting and drawing inferences, they become more capable in processing written language and more familiar with language patterns and vocabulary (Neuman, 1998; Teale & Yokato, 2000).

In literacy-rich classrooms, some children are able to learn the skills and strategies necessary for reading and writing through engagement in meaningful activities. However, it is important for teachers to adjust teaching strategies according to children's needs. Some children need explicit, direct instruction in order to master the task, and teachers must try to achieve balance between meaningful activities and skill practices (NAEYC, 1998; Neuman, 1998; Schickedanz, 1998; Teale & Yokota, 2000).

If a child fails to make expected progress in literacy learning or if their literacy skills are advanced, teachers also need to prepare more individualized instructional strategies to meet the child's needs (Lin, 2001).

Learning to read and write is a critical achievement in life. Research reveals conclusively the link between early literacy and later academic and career success. To ensure that every child becomes a competent reader and writer is a responsibility shared by teachers, families, and communities. The role of educators in early literacy instruction is to teach basic skills and to provide rich, meaningful, engaging learning environments supported by appropriate teaching practices. Each child comes to the classroom with different literacy experiences and abilities, and teachers need to consider each child's needs to provide balanced programs with explicit instruction and meaningful reading and writing tasks (Slegers, 1996). When children are encouraged to learn independently, and when teachers, parents, and communities work together to build optimal environments for that learning, children's success in reading and writing can be expected (NAEYC, 1998; Neuman, 1998; Schickedanz, 1998).

Quatroche's article notes that the development of effective intervention programs and instructional strategies for the struggling or underachieving reader continues to be a topic of concern.

Reviews of effective intervention programs have targeted some common characteristics that make these programs successful (Snow, , 1998; Pikulski, 1994; Pinnell, 1994; Wasik & Slavin, 1993). One-on-one and small group tutoring tend to be most effective for children who are struggling with reading, as these provide the most individualized attention and extra instructional time these readers needs. The instruction for struggling readers needs to be congruent with the regular classroom so that the two programs are coordinated. Children who are

struggling to learn to read need excellent instruction provided by highly-skilled personnel. This includes the instruction provided in the regular reading program and the intervention program. These components would be essential in any program to help underachievers in reading.

Successful interventions, which have targeted both older and younger underachievers in reading, have included the following effective instructional practices:

1. Letter-sound relationships and word identification strategies should be taught explicitly. Teach phonological awareness, letters, words, and word patterns. These skills are essential for success as a reader (Grossen, 1997).
2. Provide repeated exposures to words to encourage mastery. Present words in small practice sets to provide scaffolding for struggling readers (Juel, 1996; McCormick, 1994).
3. Explicitly teach strategies for understanding text and monitoring comprehension. Some strategies teach include K-W-L, self-questioning, visual imagery, ReQuest, retelling, and question-answer relationships. Provide instruction that will help struggling readers transfer these strategies to other tests (Dole, 1996; Sorrell, 1996).
4. Provide multiple opportunities for repeated reading of connected texts to develop fluency. Methods of encouraging repeated reading include paired reading, modeling, direct instruction, choral reading, neurological impress, and providing easy reading materials. Repeated reading also helps to increase the word recognition rate and accuracy of the readers (Quatroche, 1999).

Cobine proposes that, although reading and writing exist only in relation to each other, writing plays little or no role in the usual instructional approaches to reading. Mostly, reading is taught as a sequence of discrete skills, which is ineffective since it accommodates the analytic reading style to the exclusion of global, kinesthetic, and

auditory styles. By writing while reading, students could learn to organize their thoughts, and, after habitually writing in response to reading, they could learn to clarify and refine their thoughts.

Reading and writing exist only in relation to each other. Writing is to reading as waking is to sleeping, and as giving is to receiving. The one act presupposes the other act. Together, the two acts are one act, and yet each remains a separate act, at the same time. Literally, to write and read, we must give and receive.

Unfortunately, in the usual instructional approaches to reading, writing plays little or no role. Mostly, reading is taught as a sequence of discrete skills to be mastered one at a time by students. Yet, when taught discrete skills out of a meaningful context in this way, many students eventually get into the habit of reading only for "information retrieval," consequently, they miss many of the ideas implied in a text (Kirby, , 1986). All in all, this kind of instructional approach to reading is simply ineffective, for it accommodates the analytic reading style more or less to the exclusion of global, kinesthetic, and auditory styles (Carbo, 1987). Furthermore, for "poor readers," those who are uncomfortable with the analytic styles, one of the recommended activities is also writing in response to reading (Carbo, 1987).

All the activities arranged before, during, and after reading, and all the specific writing assignments made along with the reading, are based upon the premise that students assimilate their perceptions of a text most fully by writing in response to reading. Through activities, such as note-taking, goal-setting, and various response-writing activities, students clarify their thoughts. Upon completing a reading/writing assignment, they have something to show for their work—something to "give;" namely,

they have a written record of their responses to a reading. And so, in a humble way, they are blessed for, as we all know, it is better to give than receive (Cobine, 1995).

Nelson's article focuses on reading ability grouping. In grouping for reading, the usual number of groups is three (Davis, 1991). Advocates of this plan justify it by facts such as these, which are supported somewhat by various studies: (a) at the Grade 1 level, the range of achievement in a class can be expected to be 2 or more years; (b) at the Grade 4 level, 4 years or more; and (c) at the Grade 6 level, 6 years or more.

Grouping practices that are appropriate for one class may not meet the needs of another class (Sanacore, 1990; Wiesendanger & Bader, 1992). Whatever the grouping plans, it should be remembered that grouping children for reading instruction is a means for facilitating learning—it is not an end in itself.

Grouping within a room has some limitations. The three-group plan, or any other plan for homogeneous grouping, may make the children and their parents' conscious of differences in achievement. This creates pressure on a child to measure up to the others in reading (Nelson, 1994).

Burnette provides more information on grouping for Reading Instruction.

Research funded by the U.S. Office of Special Programs (OSEP) has identified a number of alternatives to whole-class instruction and ability grouping and provided information about their effectiveness. Such grouping formats include peer (same-age) tutoring, cross-age tutoring, small learning groups, and combined grouping formats. The research shows that these alternative groupings produce better reading outcomes for students with and without disabilities than does whole-class instruction.

Peer tutoring has repeatedly been found to be an effective method of teaching reading to students with disabilities. While one meta-analysis (Mathes & Fuchs, 1994) found that students with disabilities made greater gains in reading when they served as tutors. Elbaum, Vaughn, Hughes & Moody (1999) found no difference between whether the students with disabilities served as tutor or tutee. Furthermore, research has shown that students with disabilities can perform effectively either as tutors or tutees, as well as in a reciprocal tutoring role. Reciprocal-role tutoring may offer an additional benefit of boosting students' self-esteem through the teaching role. Use of this technique requires an understanding of the process, organizational planning, training of tutors, and careful monitoring.

Small group reading instruction has been shown by many research studies to be more effective than whole-class instruction, but most of these studies did not include students with disabilities. Breaking the class into teacher-led groups of 3 to 10 students helps students learn significantly more than when they are taught using whole-class instruction. Small groups appear to be better; groups of three to four students are usually more efficient than larger groups of five to seven students in terms of teacher and student time, lower cost, increased instructional time, increased peer interaction, and improved generalization of skills.

Often, teachers find themselves with one reading group, usually the lowest, for which a group lesson is unprofitable. An individualized approach would be more beneficial for these children. In a 30-minute period with this group, the teacher could spend several minutes with each child. The others could read ahead silently in a book appropriate for them, asking for help when they met new words. Each child should

progress at his/her own rate, and no two would be at the same point. Four or 5 minutes could be used for group discussion, motivation, words that are difficult for some children, and the like. Whenever the range of individual abilities in a group is so wide that it is impossible to choose a reading text that is reasonably satisfactory for the group's members, use of an individualized approach with that group should be considered (Burnette, 1999).

The article by Hickey and Braun provides us with information and resources for differentiating instruction for students with reading difficulties.

Simms (1988) indicates that poor readers may have difficulty following directions because of short attention span and memory or vocabulary deficits. The teacher should be concise and clear with an oral version of written directions. Periodic checkpoints can help break up lengthy assignments into more manageable tasks.

Students must be able to determine the main idea in a reading selection and distinguish relevant details from among those presented in order to understand what is read. Direct instruction in comprehension strategies may be necessary.

Sequencing of events and accompanying cause-effect relationships are often represented visually in materials, such as charts, time lines, or diagrams. Such concrete representations of key concepts can be especially helpful to the poor reader; teachers should make a special effort to draw attention to, and explain information contained in, textual graphics.

The distinguishing of fact from opinion is a critical reading skill. Although a higher form of comprehension, the separation of fact from opinion can be taught to even the poor reader, through the use of direct instruction.

Practice in skimming can help prevent disabled readers from becoming bogged down by lengthy passages. Having a purpose for reading gives students an incentive to search for relevant information.

Zipperer (1987) suggests that many reading problems may occur when learners bring insufficient background knowledge to the reading act. The richer the background brought to the reading act by readers, the better their ability to integrate new information from the printed page with the information acquired through prior experiences. Students who lack adequate background in content and language, such as disabled readers, do not comprehend as well as readers with a more sophisticated experiential background. Idol's study (1987), in which she provided modeling of critical thinking strategies to disabled readers during their reading of a text, shows that disabled readers can benefit from the modeling of effective reading skills.

These and other studies further support the need for special instruction for disabled readers. Peer tutors, cooperative groups, or even a buddy system, can facilitate remediation of needed skills. Modeling of effective reading strategies by teachers, providing clear directions in an oral format, and making allowances for insufficient background experiences, have also been shown to benefit disabled readers.

Generally speaking, the same reading skills good readers employ to interpret content should be taught to less able readers, but more careful attention must be given to direct skills instruction for disabled students. Examples of these skills are presented below:

- Define unfamiliar words in context.
- Recognize main ideas and supply supporting details.

- Recognize cause/effect relationships.
- Distinguish fact from opinion.
- Compare and contrast sources.
- Use tables of contents, indexes, and glossaries, efficiently (Hickey & Braun 1990).

Aiex helps and informs those teachers who are contemplating using children's literature to teach reading.

Through the use of children's literature in a school reading program, youngsters can enter the world of literature while they learn to read. Works of literature can have an integral place in the earliest stages of a reading program through a teacher's practice of reading aloud (Higgins,). Some language arts specialists hold that real stories and real characters are better vehicles for teaching reading comprehension than the basal readers and accompanying workbooks (Smith-Burke,). At the very least, real literature could be substituted sometimes for the excerpts found in basal readers.

Tunnell and Jacobs ( ) review the findings of several recent studies which support the success of a literature-based approach to literacy for various types of students, including limited-English speakers, developmental readers, and remedial readers, as well as ordinary readers. They describe common elements found in different literature-based programs, such as the use of natural text, reading aloud, and sustained silent reading.

Classroom teachers who wish to use literature for reading instruction but are apprehensive because of lack of knowledge about children's books can work closely

with the school librarian or with the children's librarian at the public library (Hanzl,). A well-stocked reading corner in the classroom gives children the opportunity to read a book more than once along with the option of sometimes reading a book with no academic follow-up activities. Teachers themselves should read as many of the books in the reading corner as possible to become familiar with the material and allow the children to observe and imitate their behavior (Newcastle and Ward,).

How can teachers monitor a student's progress in literature based programs without skill workbooks or tests to grade? Children can write a short paragraph about a book they liked (or did not like). Teachers can develop checklists to fill out as they listen to children read. Teachers can observe whether the students (a) show interest in words, (2b can tell a familiar story, (c) can point to individual words on a page, (d) turn the pages at the appropriate time when a story is being read aloud, (e) can find a familiar book on a shelf, (f) choose to read a book or to write during free time, (g) notice words and symbols in the classroom setting, (h) spell words, (i) ask questions about print, and (j) are aware that print has meaning. Teachers should become continuous observers who monitor the child's interaction with materials in the child's educational environment.

Most parents will accept a teacher's observation that a child is making progress in reading, even without the reinforcement of test results. A child who is an enthusiastic readers by the end of the third grade will continue to develop competence in the upper elementary grades (Aiex, 1990).

Simic (1993) focuses on how teachers can integrate computers into reading/writing instruction.

Research studies (Reinking, 1998) indicate clearly that computer instruction is effective for a wide variety of reading skills and concept areas. The level of popularity of computer-based instruction in reading may vary, but few will dispute the fact that computers have won a permanent place in most classrooms. The most common concerns of educators now have to do with the effectiveness of computer-based education, and with the appropriateness of the many possible roles computers can play in language arts instruction.

The emphasis should not be on using computers to increase reading and writing achievement, but rather on whether teachers use computers for meaningful reading and writing instruction, or are locked into computer-based, drill and practice software. This digest focused on how teachers can integrate computers into reading/writing instruction.

The following guidelines may also be used as a checklist to help teachers of the language arts make use of their computer with what is known about the reading/writing process. It is hoped that the checklist will be used in a context where students are given opportunities to work in all the various computer modes: tutors and tutee.

Guidelines for computers and reading:

1. Computer instruction in reading should focus on meaning and stress reading comprehension:
    - Learners should have opportunities to work with whole, meaningful texts. Programs that offer learners a chance to process large chunks of related text, rather than bits and pieces of unrelated language

fragments, allow students to use and extend what they know about reading comprehension.

- Learners should have opportunities to work with word-recognition programs that stress the use of word meanings in conjunction with phonics and structural analysis.

2. Computer instruction in reading should foster active involvement and stimulate thinking:
   - Learners should have opportunities to discuss the purpose of the computer task or program, as well as its nature. They should be aware not only of what they are supposed to do but also of why doing it is important.

3. Computer instruction in reading should support and extend students' knowledge of text structures.
   - Learners should have opportunities to encounter a wide variety of text structures upon which to apply and refine their comprehension skill.

4. Computer instruction in reading should make use of content from a wide range of subject areas.
   - Learners should have opportunities to use the computer as a means of applying reading strategies to all areas of curriculum. Programs related to science, social studies, and math require the use of strategies for reading comprehension.
   - Computer instruction in reading should link reading and writing.
   - Learners should have opportunities to create text with the computer for sharing and use by others. When students enter information into the computer for someone else to retrieve and use, they must compose with the reader in mind. This frequently involves making explicit use of what

> they know about what makes a text comprehensible. Revision and proofreading strategies clearly involve the combined application of reading and writing skills (Simic, 1993).

Purpose

The purpose of this case study/data collection is to gather information regarding the extent to which supplemental activities in reading, (after school tutoring), are effective in improving school achievement in target-assisted students. The hope is to find out that supplemental instruction in reading can be more effective with low-achieving reading students.

Data Collection and Results

Respondents

Four third-grade teachers recommended students whom they felt needed supplemental activities in reading from their experience with them in the classroom. After sending letters to their parents, I ended up with seven third-grade students to tutor in reading, after school for 90 minutes, 3 days per week. For anonymity, they will be known as student 1, 2, 3, 4, 5, 6, and 7.

The Instrument

A pre-test from the *Georgia Reading and Language Arts Coach, Grade 3*, was administered on the first day. The only instruction given was: Write your name at the top of your paper. Read each passage carefully and answer the questions that follow.

The same exact test was administered on the final day as a post-test, with the exact same instructions. The pre- and post-test results are contained in Figure 1 and Figure 2.

Procedure

I met with all six students on Monday, Tuesday, and Thursday from 3:00 p.m. to 4:30 p.m.. for 12 weeks. The daily schedule was as follows:

3:00 p.m. - 3:30 p.m. Direct Instruction
3:30 p.m. - 4:00 p.m. Silent reading/Listening
4:00 p.m. - 4:30 p.m. Group/partner work

Direct Instruction

During this time, I taught strategies for understanding text and monitoring comprehension. I used K-W-L charts, self-questioning, visual imagery, retelling, and question-answer relationships. I focused on students being able to determine the main idea in a reading selection, sequencing of events, cause-effect relationships, making inferences, predicting, and distinguishing fact from opinion. I also used this time to model effective reading strategies and provide clear background information, when necessary. The students and I went over unfamiliar words and letter-sound relationships.

Silent Reading/Listening

During this time, the students would read silently or listen to the selected text on tape. I furnished comfortable furniture, lively displays, varying levels and varieties of reading materials, and good lighting. All the students read the same text each day. If it was too frustrating for a

student, I would let them read along with the tape. This gave us an opportunity to discuss with each other what was read. Sometimes we read the same text or passage all week to develop fluency, increase word recognition, and accuracy of the reader. I did more individual tutoring during this time according to the student's need.

Group/Partner Work

During this time, the students would work in two heterogeneous groups of three or with a partner. We did several different activities at this time, varying day to day. We reread the text aloud, providing the students an opportunity to read to each other.

Sometimes, the students would respond in writing to the text. There were several ways to do this, such as: My favorite part is, My favorite character is, I liked this story because, I did not like this story because.

Other activities included answering comprehension questions related to the text, and sequencing events and determining fact/opinion in the story by cutting and gluing.

The students had opportunities to use the computers during this time. Word recognition, comprehension, and phonics programs were experienced, at this time.

Results

On the pre-test and post-test, the students had to read the passage, *Sleepy Head,* and answer five multiple choice questions one short answer question (one to three sentences). The *Bird Watching passage* had five multiple choice questions to answer. *The Ants* passage had six multiple choice questions and one short answer question. *The Nightingale and The Emperor* passage had five multiple choice questions and one short answer question to complete. There were 24 questions to answer, in all. Each question was worth approximately 4.2 points. I rounded to the nearest whole number when figuring percentages.

Pre-test

Student	Questions Answered Correctly	Percentage Correct
1	10	42%
2	5	21%
3	9	38%
4	12	50%
5	14	58%
6	7	29%
7	10	42%

Post-test

Student	Questions Answered Correctly	Percentage Correct
1	15	63%
2	13	54%
3	11	46%
4	17	71%
5	18	75%
6	18	75%
7	12	50%

Figure 1. Pre-test and post-test data.

Figure 2. Comparison of pre-test and post-test scores.

Conclusions and Recommendations

The data show that supplemental services (after school tutoring) in reading are effective in improving student achievement. Each of the seven student's scores improved on the post-test after 12 weeks of research-based instruction in reading. The levels of improvement varied from student to student. The highest improvement was 46%, the lowest improvement was only 8%, and the average improvement was 22%. Of course, other factors, such as the regular education classroom, could have contributed to the improved test scores. However, according to this study, the results were significant enough to continue to provide under-achieving students with the opportunity to participate in supplemental services.

The obvious concern in implementing these programs is money. The hope is that the government will continue to provide the funds necessary for the supplemental activities in the future. Regardless of the source of funds, these supplemental activities need to be in place in each and every school.

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Motivational Techniques for Middle School Mathematics

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The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-022.

Introduction

Statement of the Topic

The topic that will be researched is student motivation in mathematics classes. There have been many studies done on techniques for motivating students and much disagreement about which techniques are the most effective. There are two main types of motivation: intrinsic and extrinsic motivation. This study will address which type of motivation has the more positive impact on learning mathematics and which teaching techniques are the most successful.

Review of Literature

Middleton and Spanias (1999) described intrinsic and extrinsic motivation as follows: "Students that are intrinsically motivated engage in academic tasks because they enjoy them" … "Students who are extrinsically motivated engage in academic tasks to obtain rewards" (p. 66). Middleton and Spanias argued that research has shown that rewards tend to weaken the intrinsic desire to learn by teaching students that they should only be motivated to learn when they are going to receive an external reward of some kind for their effort. Other research suggests that a student's belief that there is real value in learning mathematics is ample motivation for many students to achieve in mathematics. The same research suggests that other methods are necessary to build intrinsic motivation in students that do not see a need for mathematics in their future (Alper, Fendel, Fraser, & Resek, 1997). Three methods used to do this are (a) putting mathematics in a real life context, (b) capturing students' imagination, and (c) tapping into their intellectual curiosity (Alper et al., 1997). Stipek, Givvin, Salmon, and MacGyvers (1998) state that, "Relative to the more traditional authoritative and directive role that teachers have played, teachers' support of students' active engagement with mathematical ideas and personal concepts

should encourage more autonomy and independence in students as well as greater intrinsic interest in math" (p. 320).

Linchevski and Kutsher (1998) argue that many people view students' abilities as the major explanation for differences in achievement in mathematics. They do not place as high a value on effort and other factors. Students' beliefs about their ability are also significant in how motivated they are to learn mathematics (Stipek et al., 1998). When students attribute their successes to ability, they tend to succeed. On the other hand, when they attribute their failures to lack of ability, they tend to fail (Middleton & Spanias, 1999). Middleton & Spanias (1999) also stated that, "The belief that effort is a mediator of ability and that failure is an acceptable phase in learning mathematics also contributes to students' self-confidence in mathematics" (p. 70).

In the cooperative learning setting, small groups of students with mixed abilities work together. Leikin & Zaslavsky (1999) concluded that cooperative learning promoted students' active explorations in the mathematics classroom. Some researchers feel that cooperative learning alone is not sufficient. It needs to be combined with structured group interactions around metacognitive processes to foster mathematical reasoning to a high degree (Mevarech, 1999).

Research Questions

Is extrinsic motivation or intrinsic motivation more valuable? Does cooperative learning increase or decrease the intrinsic motivation of highly able students?

Data Collection and Results

Participants

The participants are seventh grade mathematics students that attend a diverse urban middle school. A majority of the student population consists of Caucasian students. There are

also African American, Latino, Asian, and other cultural groups represented in the school population. There are students that speak 12 major languages in the school. The cultural and language issues are handled, in part, by an ESL teacher and an interpreter. All school personal are in contact with the diverse student population. The school has attempted to embrace all of the different cultures and they seem to have succeeded in this attempt.

The school has several rules in place that involve student appearance. The dress code calls for the students to wear either gray or blue pants. Any color of polo shirt is allowed. The students must wear a belt at all times. All skirts must be knee length or longer. The only area on the body that can be pierced is the ear. Body art cannot be visible. Hairstyles cannot disrupt the class and the hair cannot be an unnatural color.

A majority of the students range in age from 13-14 years. Approximately 75 students will be involved in my research. Approximately an equal number of boys and girls will be involved. Two classes will be involved. One is a higher functioning class and the other is a lower functioning, inclusion classroom.

The students come from various home circumstances. These circumstances include, but are not limited to, the following: two-parent homes, single-parent homes, foster homes, grandparent homes, and multiple-family homes. A majority of the students eat free or reduced lunch. Most of the homes that the students come from are not considered affluent.

The school building was built in the 1950s. The school population seems to be outgrowing the building. There are a few teachers that “float” from one place to another due to a lack of classrooms. The teachers’ lounge is now the clinic. For the most part, the facility seems to be functional. The walls are painted concrete blocks on the inside and red brick on the

outside. The bathrooms have standard, functional, white fixtures. The school was not built to be aesthetically pleasing.

Instruments

Data was collected through teacher interviews, student interviews, student questionnaires, and observations. A notepad and the questionnaire, itself, were my primary recording tools. The school allowed the researcher to view student grades.

Procedures

Each student that returned both the parent consent form and the student consent form was given the initial questionnaire. The questionnaire was given to the students on one day and the interviews were done 2 days later. Only 10 students were interviewed. The students that were interviewed consisted of five lower-achieving students that are motivated to learn and five higher-achieving students that are motivated to learn. Those same 10 students were observed for 3 weeks during math class.

Data Collected

1. Grades for all students involved in the research.

The grades for the students were collected during a pre-test and post-test activity. The tests consisted of 25 computation problems. Five of those problems were word problems. Each response was valued at four points for a total of 100 points. The students' averages prior to the pre-test were also considered.

2. Questionnaire responses.

The questionnaire consisted of 10 simple yes or no questions. A total of 40 students completed the questionnaire.

3. Researcher interviews for 10 students selected for further polling.

   The interviews consisted of 13 more in-depth questions concerning motivation.

4. Knowledge gained during observations.

   Information verifying or contradicting the students' questionnaire responses was noted. The students' participation and effort during class were observed. The frequency with which they turned in homework and the length of time spent on tests were also noted.

Data Analysis

The data was analyzed by the researcher's interpretations. The data was organized and analyzed by the following categories:

1. Ability versus Effort.

   The data collected showed a direct correlation between ability and achievement. The students who had good grades prior to the pre-test performed well on the pre-test. Those same students made significant gains on the post-test that was given 2 weeks after the pre-test.

   A correlation between effort and achievement was not evident. One student tried extremely hard, but that student showed little improvement between the pre-test and post-test. The student also had very low grades on both tests. This student's behavior during observations indicated that she tried harder than most students.

   The students that had low grades on the pre-test showed little improvement on the post-test. Some of these students actually had lower scores on the post-test than they had on the pre-test. Most of these students were attentive during class and turned in a majority of their homework assignments. This indicated that they had expended a significant amount of

effort. Consistently, those students indicated on their questionnaires that they tried in mathematics. These facts suggest that ability is at least as important as effort.

2. Intrinsic versus Extrinsic.

All of the students who responded on the initial questionnaire indicated that it was important to them to pass math. A majority of students indicated that they cared whether the passing grade was a high grade. However, 4 of the 40 students said that they did not care what their grade was as long as they passed. Two of the 10 students interviewed indicated that promotion from one grade to the next was their primary reason for trying to make a good grade in math. Therefore, the desire for promotion from one grade to the next grade level is an important source of intrinsic motivation.

The most frequently mentioned sources of motivation were the desire to please parents and the desire to feel good about oneself. Four out of 10 students interviewed indicated that pleasing their parents was the primary reason that they tried to make a good grade in mathematics. All of the students interviewed indicated that they tried to make good grades in order to feel good about themselves. The two top reasons for attempting to make good grades further emphasize the importance of intrinsic motivation.

The interviews showed that eight out of nine students would try harder on a single test if they were offered a reward to make a good grade on the test. That may make extrinsic motivators a solution for specific tests, but it does not mean that the students will continue to study for subsequent tests. Although extrinsic motivation seems to be valuable as a short-term tool, I do not believe that it is the best type of motivation for long-term learning. A combination of the two types of motivation seems to be the best option.

3. Traditional Learning versus Cooperative Learning.

The comparison between cooperative learning and traditional learning yielded some interesting results. The most interesting was the fact that the highest achieving student and the lowest achieving student in the achievement spectrum indicated that they did not like to work in groups. The students in the middle of the achievement spectrum indicated that they enjoyed working in groups. However, with the exception of the highest achieving student and the lowest achieving student, the higher the achievement of the students, the less time they enjoyed working in groups. A combination of traditional and cooperative learning seems to be a valuable way to motivate most students.

4. Positive Attitudes Toward Mathematics versus Negative Attitudes Toward Mathematics.

The research showed very little correlation between a positive or negative attitude toward mathematics and achievement. Most students indicated they are aware that they will use mathematics in the future and said that they liked mathematics. The grade range for these students and the level of motivation displayed by the students varied widely. The students' attitudes toward mathematics and achievement do not appear to be closely related. Instruments and data are contained in Appendix A.

Conclusions and Recommendations

There is no question that parent involvement in the education of their children is important in many areas. It appears to be very important in the area of motivating middle school students to learn mathematics. The approval and praise of parents for high performance in academic subjects seems to be very important at this age. One of the most common responses that I received for why students tried to perform well in mathematics was to please their parents.

A teacher can take advantage of a student's need to please his parents in more than one way to motivate the student. The teacher can talk to the student's parents during parent-teacher conferences and stress the importance of their involvement in the child's education. The teacher can let a student know that they plan to call that student's parents when he is not performing as well as normal. The teacher can also send a letter to the parents of her students at the beginning the school year stressing the importance of their involvement, encouragement, and praise to their child's performance in mathematics. Multiple methods of contacting the parents may be needed.

A combination of extrinsic and intrinsic motivation seems to be the best approach to learning mathematics. Most students seem to have some intrinsic motivation, but many lack the confidence to perform well. For the students with a lack of confidence, extrinsic motivators such as casual days, pizza parties, or field trips may be the best methods of motivation. The preceding activities also enhance the motivation of students that already perform well in mathematics. Extrinsic motivation and intrinsic motivation are both valuable tools.

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Appendix A

Instruments and Data

Questionnaire

Please circle yes or no as your response to the following questions.

1. Do you like School? Yes No
2. Do you like Math? Yes No
3. Do you try hard in Math? Yes No
4. Do you try to complete your homework? Yes No
5. Do you care if you pass or fail Math? Yes No
6. Do you care if you have a high or low grade in Math? Yes No
7. Do you think you will pass Math? Yes No
8. Is it important to you to graduate from high school? Yes No
9. Do you plan to attend college? Yes No
10. Do you think you might major in something in college that requires a large amount of mathematics? Yes No

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This portion of the form will be removed:

_____

Student Name (Please Print)

Interview

1. Have you ever worked in a group in a mathematics class? Yes No
2. Do you like to work in groups during class? Yes No

3. Does it help you when you work in groups? Yes No

4. How long do you like to work as a member of a group during class? 0 5 10 15 20 30 40 50
5. Do you like to work problems by yourself during class? Yes No

6. How long do you like to work by yourself during class? 0 5 10 15 20 30 40 50
7. Do you think you will use math in the future? Yes No

8. If you were offered a reward if you made an A on your next math test would you study harder for the test? Yes No

9. If you make an A on the test and you are not offered a reward for an A on the next test, will you study as hard for the next test? Yes No

10. Do you try to make good grades in math to please someone else? Yes No

11. Do you try to make good grades in math because it makes you feel good about yourself? Yes No

12. What do your friends think about you making a good grade in math?

13. What is the primary reason you are trying to make a good grade in math?

Questionnaire Responses

Question	Responded Yes	Responded No
1	31	9
2	34	6
3	36	4
4	39	1
5	40	0
6	38	2
7	36	4
8	39	1
9	38	2
10	17	23

Interview Responses

Question	High Achieving Students	Low Achieving Students
1	Yes – 5 No – 0	Yes – 4 No – 1
2	Yes – 4 No – 0	Yes – 3 No – 1 Neither – 1
3	Yes – 2 No – 2 Neither – 1	Yes – 3 No – 1 Neither – 1
4	50 minutes – 1 30 minutes – 3 15 minutes – 1	50 minutes – 1 30 minutes – 1 20 minutes – 3
5	Yes – 4 No – 1	Yes – 3 No – 2
6	50 minutes – 1 30 minutes – 1 20 minutes – 1 15 minutes – 2	30 minutes – 1 20 minutes – 1 15 minutes – 2 5 minutes – 1
7	Yes – 5 No – 0	Yes – 3 Neither – 2
8	Yes – 4 No – 1	Yes – 5 No – 0
9	Yes – 4 No – 1	Yes – 4 No – 1
10	Yes – 3 No – 2	Yes – 3 No – 2
11	Yes – 5 No – 0	Yes – 5 No – 0
12	"We have contest to see who gets the best grade so I try to beat them." "OK" "I don't think they really care." "I really don't know!" "I'm smart"	"Good" "Yeah for me" "Don't know" "They congratulate me and say good job." "That I am slow."
13	"I like to be congratulated by my parents and my teachers." "To get a college scholarship. To earn for church." "To make myself feel better about myself and to make my parents proud." "Because it will help me in the future and it is something I need to know!" "My parents"	"So I can go to Six Flags and Ruby Mines." "My mom" "So I can pass." "So I will know how to do it when I get older and if I buy something and they might try to charge me more and I will no how much I will get back and so I can pass to the next grade." "Because I listen in my class."

Name_____ Date_____ Period_____

Show your work on each problem and circle your final answer.

1. 38.06 + 7.3 =

2. 38 – (-15) =

3. 5% of $50 =

4. 5.6 × .014 =

5. 65 – 20 ÷ (2 + 3) =

6. 6 – 1.05 =

7. 10 1/5 – 8 4/5 =

8. 5 3/4 ÷ 1 1/3 =

9. 5/21 + 4/7 =

10. 30 ÷ 0.0005 =

11. 21/48 × 8/45 =

12. –50 × 7 =

13. 15 + 3(2 – 1) – 6 ÷ 2 =

14. –56 ÷ (-8) =

15. ((16 - 4) ÷ 3) × 7 – 8 =

16. 26 + (-18) =

17. 15 is 30% of what number?

18. 15% of 40 =

19. 48 – 36 ÷ (4 + 2) =

20. 6 is what percent of 24?

Steps to Solving a Pedagogical Dilemma

in Preparing Students for Written Assessments in French

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Abstract

In the last 50 years, there has been an explosion in the field of second language acquisition that has given the foreign language classroom a more facilitative feel to it. One has switched from primarily studying grammar and vocabulary word lists to using the language in an appropriate "authentic" context. However, many of the modern methods have had some problems. The arguments mainly surround the role of grammar and direct instruction in the classroom. Those who support modern methods tend to shun direct instruction. This author has embraced the modern methods of foreign language teaching and has been impressed with the levels of oral output students are able to achieve but has been disappointed with the inaccuracies found when assessing students written output. This study will attempt to see if students are able to achieve better written scores through improved accuracy when given direct instruction on how to conjugate verbs in French.

Introduction

The modern foreign language classroom can be a wonderful place for learning a foreign language. In traditional classes, students generally learned lists of related vocabulary words along with the specific rules of grammar. Today's methodologies, spurred on by the research of Noam Chomsky, have attempted to swing the pendulum the other way. In this study, the communicative method is used as a general term for the new methodologies, however not all of the newer methodologies are, in fact, communicative but most do combine such elements. Traditional methods refer to the audio-lingual method and direct instruction. The people who are at the forefront of foreign language acquisition have shunned the practice of directly studying grammar in the classroom and have put the responsibility of learning the precise rules of grammar on the students' shoulders. These researchers believe that the language classroom is

the place for practicing the language and not for learning rules and vocabulary word lists that have no context or meaning.

This author has been trained in the modern ways of using the foreign language classroom as a forum for language in context. However, in his years of experience, he has been frustrated to find that, although students' oral/aural output ranges from fair to excellent, which is positive, the other side of the equation, the written output, ranges from fair to disappointing. One of the reasons this fact may be is that teachers are no longer stressing grammar learning in the classroom and have left that responsibility to students. Many students do not seem to make the connection between the way they say something to the way it should be written, particularly when learning languages, like French, which do not have direct "letter to sound" writing systems. Students also do not seem to study the way they should for written examinations.

To counteract this problem, this author will study whether returning to direct instruction of grammar helps students in increasing their written accuracy, and consequently, their written scores. He will attempt to achieve higher accuracy rates by studying specifically whether the insertion of a verb paradigm-a device which shows the changes in spelling (and sometimes pronunciation) a verb makes when conjugated according to the person doing the action-into his instruction helps increase the written accuracy of those verbs. Such practice was standard in the foreign language classroom before the latest (r)evolution in teaching, but what do published authors say about such practices today? Can one achieve better written accuracy for his students by teaching grammar directly? To find out, this author turned to the literature.

Review of Literature

The idea that being immersed into the target language as being the best way to learn a foreign language is certainly not a new one. Most definitely, the idea of sink or swim when

faced with being forced to communicate in a different language is a great motivational factor. However, one cannot really create such an environment in a classroom. Students who are otherwise unmotivated to learn know that they can get by with minimal participation, which does not help them acquire a language very well. If they do perform at such a level, this act would, in theory, diminish their ability to learn to speak and write. However, techniques to try to convince students of the importance of learning foreign languages, such as better paying jobs and more cultural awareness, generally fall on deaf ears, especially among white, native English speakers who make up a majority of college prep courses (to which foreign language classes belong) in high schools (Cortés, 2002).

This study focuses on French language learning. Fallon (2002) reports some success in inspiring college-level students to take French by creating a French studies course, focusing first on the "lost generation" writers who lived in Paris during the prohibition era in the United States and then he elaborates in his course on the French writers who helped inspire the Americans. However, such courses can only do well if universities and secondary schools have the money and staff to support such courses. It also would be motivational only to those students who are interested in literature and, although this study does not focus on motivation as the primary means to convey accurate writing skills to students, motivation is an important factor in whether or not one learns a language. To that end, there have been many studies that focus on motivation as a factor, each looking at different aspects, such as gender (McDevitt & Ormrod, 2002), and students who have a definite, defined ethnic or national origin identity (Cortés, 2002).

Time is also of the essence in foreign language learning. Many of the modern methods of foreign language learning are nativist in their approaches. Nativism is a term that is applied to Noam Chomsky's theory of universal grammar (McDevitt & Ormrod, 2002). Under the nativist

approach's banner, the brain is wired to learn language and that the wiring is genetic in origin. Since a child learns language by being exposed to countless hours of input, the child's brain naturally begins to sort out that input, and at some point in time (usually at or around the first year), the child begins to produce baby speak as he begins to exercise his vocal chords. This exercising also occurs among deaf children, who cannot hear the input, which could lead one to support the idea that humans are natural talkers (McDevitt & Ormrod, 2002). After the age of 1 year, babies begin to put these sounds together to create words. Eventually, an explosion in a child's ability to produce language occurs sometime after the age of 2, but as to how that actually happens is highly debatable. Such ideas fall under both Piaget's and Vygotsky's theories of cognitive development.

Supporters of the communicative classroom in foreign language learning have seized upon the idea of universal grammar in their development of ideas as to how to best teach students a foreign language. Some of the big names within the field have been, of course, Chomsky, but also Krashen. These theorists have taken the ideas as to how a child learns language and have tried to fit them into the foreign language classroom. However, this author's biggest critique of these ideas is that babies have time, an overwhelming abundant amount of time, to receive the contextualized input (input dependant upon the meaning of the situation at a given time) necessary to create language. Unfortunately, the average foreign language teacher does not have even a fraction of that time. Sato (1999), in her study of ESL (English as a second language) and EFL (English as a foreign language) students, indicates that time is essential for the students to adequately assimilate a second language, regardless of their other motivational factors. Since foreign language teachers have time constraints placed upon them, they must rely on the students to fill in the necessary gaps.

Relying on students to fill in those gaps is a dangerous necessity because of their external and internal motivations. Unfortunately, one can begin to see a vicious circle developing. In order for the students to effectively fill in the gaps, they must do two things. The first is, of course, study. The second is that the students, themselves, must be willing to devote themselves to the chosen vehicle of learning a foreign language. This devotion to the process must also exist among teachers. Many theorists or innovators try to package their methods as complete packages and tell those who would listen to avoid using other methods because those methods do not work.

Thus, the author is left with his main question of inquiry: How can one prepare a student to become a successful learner of a foreign language, particularly in getting the student to be ready for the next level, especially when the students have various learning needs, some of which many of today's methods leave behind because they are geared to one kind of learning over another? There have been studies conducted that could point the author into a certain direction. Some of these studies, although they do not admit it, have led the author to conclude that the traditional means of learning a foreign language could help.

The Traditional Method

The audio-lingual method of learning a foreign language is considered to be the traditional means of instilling foreign language learning in students. This is the idea (believed to be taboo today) of drill and kill. However, experience guides this author into believing that, perhaps, it is not as bad as some would have him believe. In this method of language learning, the teacher says a sentence or word and the students repeat it, ad nauseam, until they finally drill it into their heads. At the same time, the students see the phrase or sentence in the textbook and have the translation of it so they know what it means. This writer has personally found this

method quite effective, at least initially, for getting the information into a student's head. However, he does agree with the communicative classroom advocates that it is pointless to try to drill students into saying noncontextual sentences like, "Le singe est sur la chaise" ("The monkey is on the chair"). Such learning is not useful and could be argued to not be true foreign language learning. However, certain ones of these practices, this researcher believes, are, in fact, useful.

The main reason the author believes in the utility of the older methods is that it is tremendously helpful in learning how to conjugate a verb, particularly in French. Although it is the horror of many a foreign language student, verb conjugation is extremely important. Verbs tell the receiver of the message everything that is going on in the sentence; the rest is background filler. Although anyone can learn to use these words orally, it takes extra effort to learn to write the verbs on paper, particularly with languages like French. However, focusing on verb conjugation in the classroom would not be considered effective use of classroom time by communicative supporters, since it would constitute direct grammar instruction. However, this author feels that the use of tools, such as verb paradigms, are useful because they help students organize the material, the verb in this instance, into a small, concisely-defined area, instead of being here or there if one were to pick up spelling accuracy from reading alone, which would be more communicative.

Schultz, in her reflection as to the state of foreign language teaching as it was and is now, points out that scientific studies on the brain seem to point to the idea that language learners do, in fact, need specific, direct language instruction (Schultz, 2002). She also indicates that even less "scientific" instruction may show that students, when left alone to their own devices to negotiate meaning in the classroom, tend to develop a certain "learnese". This phenomenon

occurs in many foreign language classrooms, especially in larger ones wherein teachers cannot always have the time to visit each group of students to monitor student progress. This author would also dare contend that, not only could direct instruction help students in their written skills, it would also, perhaps, work in their oral ones, as well, because they would be able to hear the verb in a more confined moment if it was repeated, instead of in a full sentence with other words that would require the learner to figure out where the verb is located.

In stark contrast, Morris (2002) negates Schultz's claim. In his study of Spanish students at the University of Minnesota, Morris claims that students do, in fact, correct each other well in a collaborative setting. Morris recorded students performing a communicative task. Each student described what a person does to get ready for work in the morning. He goes on to claim that only a small portion of the utterances made by students could fall under the category of "learnese" that Schultz describes. In most cases, students do, when left to their devices, correct each other when appropriate, and do so accurately.

However, Morris' method leads this researcher to question his claims. Although he says he takes into account motivational factors in learning a foreign language, his students are not novices even though they are taking a beginning Spanish course. What is more alarming is the fact that not only are they not novices (the average number of years of prior Spanish study among the students is 3 1/2 years), it is quite conceivable that many of the students had been exposed to the vocabulary of the exercise thoroughly enough in the past to make the exercise he used to prove his findings ill chosen (Morris, 2002). If Morris wanted to prove his point better, he should have used material that is not commonly studied in high school. He needed vocabulary/grammar that would, in other words, be "new" to the students, such as an exercise using the subjunctive mood or "if...then" clauses. Also, his use of pictures to help create a story

does not necessarily produce more accurate writing, and, as stated earlier, it is that particular task that students will need in order to be prepared for any advanced studies they may one day choose to pursue.

The Necessity of Good Writing Skills

According to the writing proficiency guidelines set forth by the American Council of Teachers of Foreign Languages (ACTFL), students who enter advanced studies should be at least at the intermediate-high level of writing, if not at the advanced-low level (Breiner-Sanders, Swender, & Terry, 2002). Students in the former category should be able to take notes on familiar topics, write letters, and writesimple summaries or essays on familiar topics. Students in the latter category should be able to perform more academic writing that does not just focus on familiar topics. In both cases, students will make errors, some serious (particularly at the intermediate-high level), but, despite the mistakes, their writing can still be understood by many native speakers. Students at the beginning level of advanced study must be immediately prepared to make that step between the two levels, thus, they must be at least a very strong intermediate-high. However, past observations tell this author that students are not achieving at that high of a level when learning through the communicative process alone. Thus, how can teachers get their students to such a level, given the short amount of time allotted to prepare them, despite such negative factors like low motivation, etc?

Combining the Old and New Methods

In the "Evaluation of Professional Development for Language Teachers in California" study, the authors of the article examine what kind of development could occur when teachers at what are considered to be "low performing schools" were exposed to the modern methods of teaching foreign languages (Lozano, Sung, Padilla, & Silva, 2002). California became one of the

few states that to pass a law regulating the teaching of foreign languages. Of course, requiring teachers to learn the modern, communicative methods means that they must learn and adopt the communicative approach alone for their classrooms.

The study divides the schools into "high-performing" and "low-performing" based on a variety of criteria and not just the effectiveness of the foreign language teachers at those schools. However, the study generally pointed out that the high-performing schools generally used the communicative approach whereas the lower-performing schools used a more audio-lingual/traditional approach. In their study on both the oral and written output performed by the students, the study's authors were shocked to find that, although the students at the lower-performing schools did score lower overall than the students at the high-performing schools, the students at the lower-performing schools showed much higher abilities to write than expected, particularly in French (Lozano, Sung, Padilla, & Silva, 2002). Such results tend to fly in the face of the communicative research that supports the idea that meaning is essential before any language acquisition can happen. Students at the lower-performing schools came from more disadvantaged neighborhoods in which, generally, enriched linguistic environments are not found; they tend to be unilingual regardless of the predominant language. If students at these schools can still show success in writing, despite being taught through an "obsolete" vehicle of instruction, what would happen if the two were combined at either type of school, especially at the lower-performing schools?

The reasons for such high scores in writing, despite the use of the traditional methods, could not be adequately explained by the study's authors. However, it could lend support to what Schultz said concerning the need for direct grammar instruction, since students in a more traditional learning environment would receive an ample amount of it. Thus, it seems that the

California law requiring teachers to adopt communicative approaches may not have necessarily been the best thing to do. So, what should be done? What should be the best way? How can one negotiate a compromise in the research?

Vélez-Rendon (2002) advocates choice for teachers as to how to teach a foreign language when she interprets Wing: "Wing favors approaches to methods courses that view prospective teachers as decision makers and assist them in developing their own pedagogies and teaching styles" (p. 462). She also adds, "Participants' references to their teacher preparation program usually focused on how they viewed the different theories of second language acquisition and on whether or not they were in agreement with them." The need to write such a comment seems, to this author, to be an admission to the idea that the communicative classroom advocates tend to be somewhat, if not entirely, dogmatic in their approach. However, students in teacher academies do not necessarily have the practical experience to observe, for themselves, whether or not, a particular method really does work, but this writer thinks that it is worth taking the theories one learns in such courses with a grain of salt.

Given some of the issues raised in the literature review, it seems that, perhaps, it could be best to incorporate some form of traditional method in preparing students to succeed and giving them the tools they need if they decide to continue with their studies of foreign languages at more advanced levels. Writing seems to have been left behind by researchers eager to get kids speaking in the classroom. Although this author agrees that speaking and understanding is very important and, perhaps, crucial, it seems that just relying primarily on those two aspects of language learning is not producing encouraging results in reading, but, more importantly, in writing. Teachers must focus on the whole and have the goal in mind, or at least consider the

fact that language learning is a building process, one that must be constantly and consistently nurtured, and that they need to get students prepared to meet the challenges of the next level.

Data Collection and Results

Thus, can the two methods be combined to achieve the stated goal, with optimal or, at least, better results than what currently exist? This study will attempt to answer that question by teaching and assessing students who can be classified as being beginning language learners, but who vary in the level of that classification. Some of these students are true beginners; others are advanced beginners. All of the students are in either the eighth or ninth grade at a K-12 school where foreign language learning is required at all grade levels, but not all of the students have attended the school since kindergarten. The students will be split into two classes, with eighth and ninth graders in each class and with students who are at the two ends of the beginner classification in each class.

The Classes and the Instructional Insertion

Both classes will be taught using one or more of the methods that can be classified as communicative because, as the author said, just learning how to conjugate a verb is part of, but not, what learning foreign language really is. However, one class will be given an instructional insertion specifically showing students how to conjugated verbs through the use of a verb paradigm. The kinds of French verbs to which the students will be exposed are both regular and irregular, and will be conjugated in the present, futur proche, and passé composé tenses. The insertion will consist of students being exposed to verb paradigms (see Figure 1 on Appendix A). The students will then be required to look at the paradigm whilst the teacher repeats it three times. The students will take turns repeating the conjugation of the verb after the teacher and after having listened to the teacher. They will also be required to write the new conjugations in a

special section of their notebook that is devoted to verb paradigms. The students in this class will then be given drill and mechanical exercises to perform, which will familiarize the students with the spelling of the verb but are otherwise divorced of meaning. The class that will receive the insertion will be referred to as Class A. The other class will not be given the insertion but will otherwise be taught the same as Class A. This class will be classified as Class B.

The classes have been randomly chosen in the usual way the administration assigns students to classes. They also are under the care of the researcher, who is a student teacher, but they are also being assisted in their learning by the author's cooperating teacher. The class that was chosen to receive the instructional insertion was determined to need the extra practice, according to the cooperating teacher.

Class A contains 16 students of various socioeconomic backgrounds and gender. Class B contains 24 students and shares the same characteristics as Class A. The only difference between the two classes is the number of students. Two students per class were classified as being learning disabled in some way. The students attend a public magnet school in Tennessee.

Data Collection and the Reporting of Data

Data collection was taken from a variety of sources, including general oral assessment, homework, and quizzes/tests. Both homework and quizzes/tests will be the main source of data since they are written assessments. The general oral assessment and homework were used to help gauge whether students were prepared to move on to the next set of material and did not figure into any calculations. The students were informed that they would be taking part in the survey and were also told that none of their names or grades would be used in the reporting of the data. The only point of interest for the researcher was whether a student made an error in the conjugation of verbs in written form and, thus, if direct instruction helped in any way. The

researcher also made a journal of the kinds of errors the students committed, however that information will not be generally discussed unless it sheds light as to why an error might have occurred. The students were never told which assignments or quizzes would be selected for the study. The collection of data occurred over an 8-week period.

In calculating the results, the author simply listed the verbs to be conjugated and tallied the number of students who made an error in conjugating them. The averages that will be mentioned in the report came from taking the number of errors made by the students versus the number of students in each class. No regular statistical calculations beyond the use of averages were used and, therefore, will not be mentioned in the report.

Results

The results will be split into various components pertaining to what kind of conjugation the students were required to perform. These categories are present tense (both regular and irregular), futur proche, and passé composé (including irregular "avoir" verb forms but completely excluding "être" verbs). A discussion of how the students performed in each class on homework versus quizzes will also ensue.

Present Tense

Students were expected to be able produce written and accurate conjugations of verbs in the present tense. The list of verbs examined is one regular -er verb, one regular -ir verb, and one regular -re verb, as well as, aller, être, avoir, pouvoir, vouloir, faire, écrire, dire, sortir, and partir, however, only the results for the irregular verbs, excluding écrire and dire, will be reported. Students naturally performed better with the chosen homework exercises than they did on the quizzes/tests, most probably because they had the conjugations to refer to when doing the exercises, yet some students still made some errors. Three homework assignments were

examined to provide the data which lead to the quizzes/tests. As for the quizzes, the researcher noticed particular problems with the verbs *faire* (vous form), *vouloir* (nous form) and *aller* (je form), and these problems existed in both classes. For the test on these verbs, the results were more promising, but still the same verbs and kinds of errors persisted, particularly in Class A (see Figures 2, 3, and 4, in Appendix B). For each figure in Appendix B, series one represents the error percentages for Class A, and series two represents those for Class B. The error rate for Class A was 52% overall, versus 31% for Class B.

Futur Proche

With the futur proche, the students performed about the same throughout the lessons with only a slight improvement on the test over the quizzes. For data collection, two quizzes and one test (the same as the test for the present tense) contributed for that part of the assessment reported here. In this case, both classes performed equally well. The most common error made was either the omission of the verb *aller* to start the tense or a double conjugation occurred in which the students conjugated both *aller* and the other verb. Those who did use *aller,* each time conjugated it correctly and, thus, improved on their assessment of the present tense conjugation of that verb, but that fact did not figure into the results. The error rate was only 17% in Class A on these assessments whereas 20% was the error rate in Class B.

Passé composé

The conjugation of the passé composé seemed to be going smoothly as far as homework assessment, however, the quizzes and the test on the tense proved to be less than what was hoped. The researcher would believe that the results are based on the relatively short period of time spent on the tense, as compared to the others, however, Class A showed a little bit better

progress than did Class B with 51% of the students having accurately answered the questions compared to 49% for Class B. The greatest errors came from the omission of the verb *avoir* on the quizzes and the mistakes made on the irregular verb conjugation forms. The error rate was 33% percent in Class A versus 34% in Class B.

Conclusions and Recommendations

It seems, to this author, that, based on percentage results, the study does not show anything extraordinary in its use of direct instruction in the French classroom. The author would like to one day redo the study. He feels that both time, in particular the duration of the study and other external factors, such as motivation, may have played important roles in determining the outcome. The author can, at best, call the results inconclusive. The results of the study were based only on rate of errors that occurred in each class.

If a future study of the topic were to transpire, there are several procedural steps that the author would make prior to, and throughout, the survey. Examples of the different procedures that would be undertaken include (a) the administration of several questionnaires, which would be geared to determine students' attitudes toward the subject matter and the amount of time they spend in studying for the class, in general; (b) a greater amount of time allotted to the study-no less than 2 semesters (1 academic year) versus the mere 8 weeks in which this study took place; and, of course, (c) an increase in the number of tests/quizzes for the students to take. Other factors that could have determined the outcome of this study could be the strengths of one class versus the other. Class B had several extremely motivated students who had a facility for learning foreign languages. Despite the inconclusiveness of the results, the author still feels that some students could, in fact, benefit from direct instruction in foreign language. The debate will no doubt continue.

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Appendix A

Pouvoir – can, to be able to	
Je peux	Nous pouvons
Tu peux	Vous pouvez
Il/Elle/On peut	Ils/Elles peuvent

Figure 1. Sample verb paradigm, for the verb *pouvoir*.

Appendix B

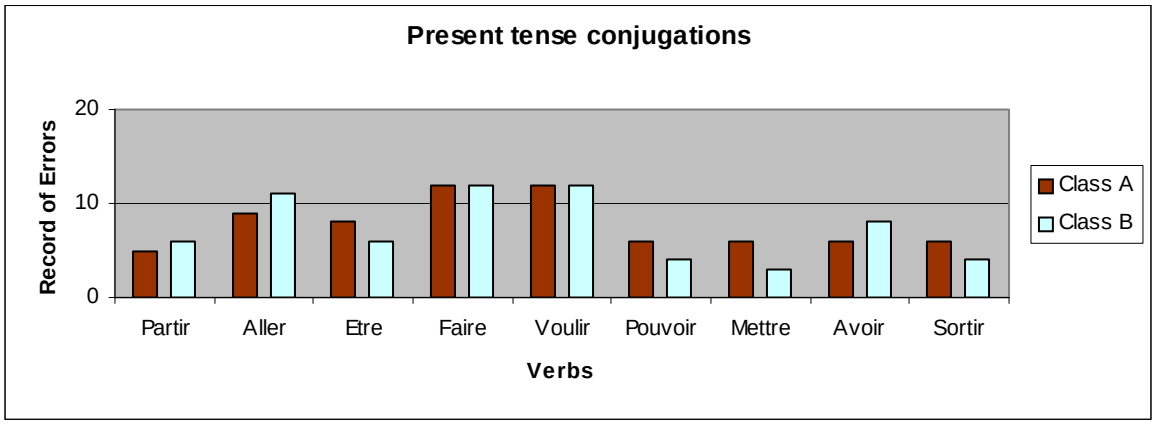

Figure 2. Present tense conjugations.

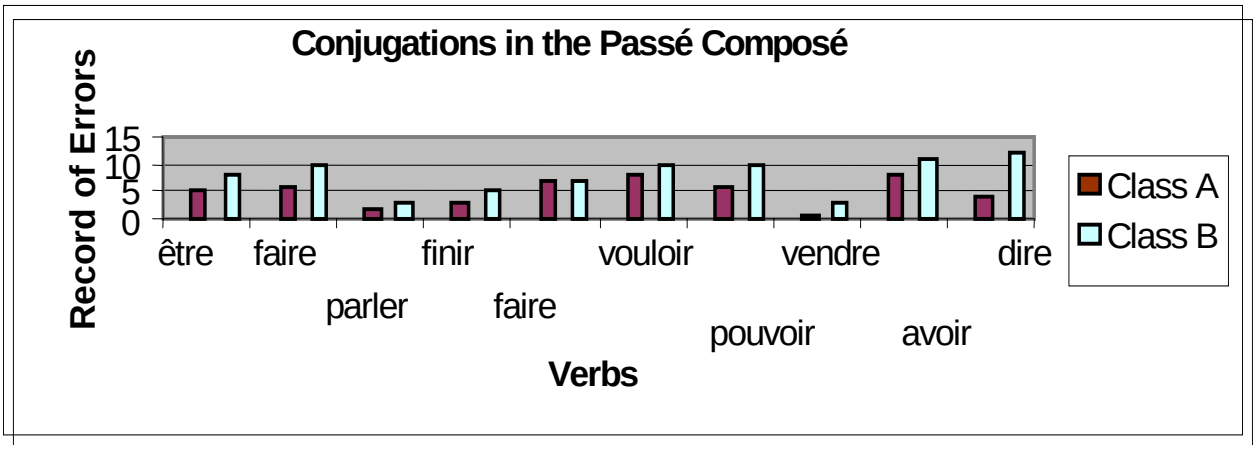

Figure 3. Conjugations in the passé composé.

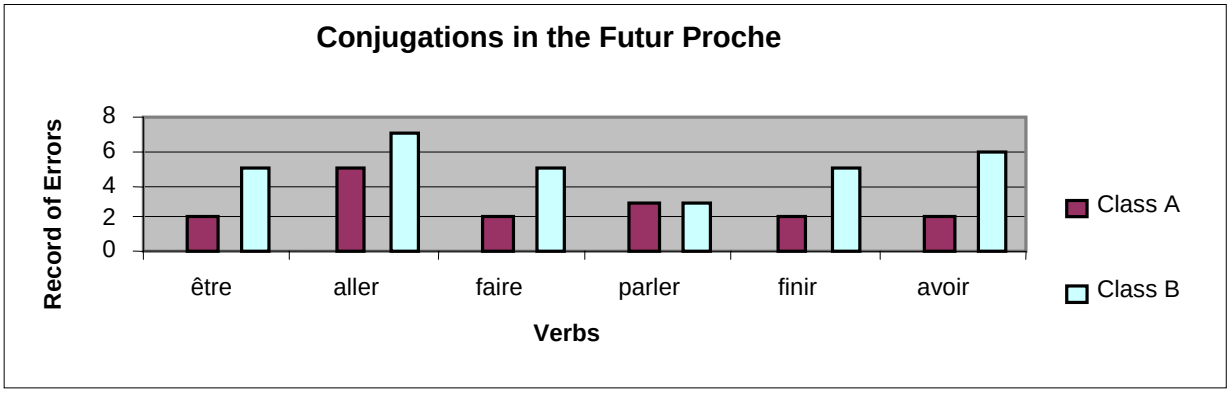

Figure 4. Conjugations in the futur proche.

Patterns

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Introduction

In recognizing the importance of patterns, the National Council of Teachers of Mathematics (NCTM) (2000a) writes that, because patterns abound in our world, "the mathematics curriculum should help sensitize students to the patterns they meet every day and to the mathematical descriptions or models of these patterns and relationships" (Annenberg/CPB, 2004, ¶ 2).

According to the NCTM (2000b) *Principles and Standards for School Mathematics*, instructional programs from pre-kindergarten through grade twelve should enable all students to understand patterns, relations, and functions. To do this students should be able to:

- sort, classify, and order object by size, number, and other properties;
- recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another;
- analyze how both repeating and growing patterns are generated. (¶ Pre-K-2 Expectations)

Number patterns are the most familiar of patterns because they are among the first patterns young students learn, but patterns, in general, are much broader and include sequential, spatial, temporal, and linguistic. In learning about patterns, students learn to apply reasoning, focus on how to develop function sense, and connect language and mathematics to develop skills for thinking clearly, strategically, critically, and creatively.

According to *The Annenberg/CPB Math and Science Project*, young children usually look at logic patterns, such as making categories and doing classification, first when learning about patterns. Children have to be able to sort and classify objects before they

can count them. One kind of logic pattern deals with the characteristics of various objects, while another deals with order: there is a sequence of objects and a pattern in the attributes the object possess. Young students should be able to arrange objects in order by asking themselves which comes next. Reasoning about sequences of attributes reinforces understanding of number and function, and leads to a better understanding of logic.

Number patterns are useful in helping young students learn about making predictions. What is the next number in the pattern? What will the twentieth number be? Working with number patterns leads directly to the concept of functions in mathematics: a formal description of the relationships among different quantities. Recognizing patterns is also an important problem-solving skill. If a student sees a pattern when they look systematically at specific examples, they can use that pattern to generalize what they see into a broader solution to a problem. As young students learn to count by 1s, then by 2s, 5s, and 10s, the patterns give them a natural strategy to understand addition and multiplication.

Annenberg/CPB writes that, often in mathematics education, the connection to language arts is forgotten. The metrical patterns of poems and the syntactic patterns of how we make nouns plural or verbs past tense are both word patterns, and each supports mathematical as well as natural language understanding.

In stating that mathematics instruction should include attention to patterns, functions, symbols, and models, the NCTM sets the purpose of patterns, functions, and algebra in mathematics educations at all grade levels so that all students (2000a, ¶ 1):

- understand patterns, relations, and functions;

- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships;
- analyze change in various contexts.

The teacher can use pattern activities to assess a student's understanding of how an arrangement is put together. The teacher might ask the student to explain an arrangement to someone else so that the person could duplicate the original arrangement. This activity would help the teacher assess the student's understanding of the arrangement/pattern and his or her ability to articulate what he/she has designed. The student could also be asked if there was another way to make the same pattern, which, in turn, would assess their ability to identify different units in a given pattern arrangement and to articulate their ideas.

Young students are very excited when they are given the opportunity to play and explore with manipulatives. Kindergarten is an excellent time to have the student begin to think about what is happening as they add another color or another block to an arrangement. What seems like play to the student can be a first opportunity on the journey to learning about patterns and their functions in the world around them.

Review of Literature

The NCTM's Standards Addenda book, *Patterns (1993),* states that "kindergarten children should focus on regularity and repetition in motion, color, sound, position, and quantity, and be involved in recognizing, describing, extending, transferring, translating, and creating patterns" (Coburn, et al., p. 4). The NCTM further states that, to understand the concept of pattern, children must recognize the predictability and repetition that patterns imply in the following forms:

- some patterns repeat the basic unit;
- other patterns seem to grow;
- patterns may emerge in unexpected ways;
- patterns are part of the world we have built.

Typical pattern activities in kindergarten classrooms involve asking students to copy existing patterns, create their own repeating patterns, or extend a pattern that had been created by themselves or someone else. For many kindergarteners, simply deciding what comes next is not simple or obvious. When young students first encounter patterns they may only see that one thing comes after another, but, at some point, it is important that they make the connection of the basic unit of the pattern. Economoupoulos writes that promoting discussion among teachers about how children learn mathematics has been shown to be an effective way to encourage teachers to think more critically about mathematics teaching. For students to use patterns in constructive ways, they must build an understanding of what patterns are beyond finding out what comes next.

Grace Burton describes pattern recognition as the act of becoming conscious of regularities, and further states that pattern perception lays the groundwork for developing the ability to form abstractions and generalizations. Attaining any concept requires analyzing and reflecting, noticing similarities and differences, and becoming aware of the distinctions between essential and nonessential features among members of the presented class. Research shows that there is a high correlation between pattern recognition and the ability to succeed on school-type learning task. In her research, Burton reports that the ability to recognize patterns has a profound effect on a child's mathematical development,

and advocates that patterning activities be granted a conspicuous place in the early childhood curriculum.

Patterning is the sequential ordering of events or objects, and provides a foundation for understanding abstract temporal and spatial sequences. A pattern is the repetition of distinct elements, and can be presented in a variety of modalities. In the visual mode, patterns can be presented with real objects, pictures, or symbols. In the auditory mode, claps, drum beats, sung notes, or animal noises will serve. A patterned sequence of motor activity might be: touch head, touch shoulders, touch knees. Many camp songs are examples of motor patterns. Pattern recognition is useful to children in skip counting leading to multiplication, in understanding the base ten numeration system, and in working with sequences and series.

Susan Ditchburn (1982) quotes Baratta-Larton who states, “Pattern is the underlying theme of mathematics. The skill of recognizing and using patterns is a valuable problem-solving tool for a child to learn to use, for it can have a profound effect on the development of the child’s mathematical understanding.” When children are introduced to patterns, they are being introduced to the idea of regularity and meaning in sequences, all of which helps them move towards generalizations and forming hypotheses which my be tested.

Patterning is a problem-solving approach that helps children search for rules and allows them to move from accidental encounters with patterns in the real world to those that are teacher-structured. Ditchburn (1982) writes that children should be encouraged to examine and analyze patterns, to discover symmetrical properties, to compare shapes and

size in ordered sequences, to create patterns, to represent sequences visually and verbally, and, finally, to use numbers or letters to symbolize patterned series.

According to Young and Maulding (1994), researchers have long advocated using children's literature in the mathematics program. Mother Goose can be used in the primary grades to help students develop a deeper understanding of prenumber and number concepts. Young children like to hear Mother Goose rhymes read aloud, and also enjoy learning the rhymes themselves. By building on what students already know and enjoy, teachers of mathematics can pose tasks that are based on knowledge of students' understandings, interests, and experience (NCTM, 1991). The rhyme, rhythm, and repetition of nursery rhymes stimulate listening skills, auditory discrimination, and language development.

Research shows that the ability to order objects in terms of some attribute is essential for the child's understanding of the properties of numbers. Seriation refers to the process of ordering object along single or multiple dimensions such as length, weight, or color. Past research revealed that children's seriation performance is affected by task-variables such as the number of objects used, differences between objects, and the amount of encoding load. Tomic and Kingma (1996) investigated the effect on seriation performance of increasing both the salient features of the relevant dimension of a seriation task and the number of objects in the series, as well as the predictive value of seriation tasks on number line comprehension. The targeted group were children from pre-school, kindergarten, and grades one and two. Results showed that 10% to 37% of preschoolers and kindergarteners were able to construct a correct series of tasks with six objects and in which the relevant feature was made more salient. A sharp decrease in the seriation

performance was observed for these children when the number of objects in the same seriation tasks had been increased from 6 to 10. In primary school grade two, all the children were able to perform the different types of seriation tasks correctly.

Data Collection and Results

While student teaching in a kindergarten classroom, I created a unit of lessons focusing on patterns. My intent was to introduce students to the concept of recognizing patterns, continuing patterns, and creating patterns using a very basic approach. Before I began teaching my unit, I administered a pre-test consisting of five different patterns that students were asked to continue. The sixth item on the pre-test asked students to create their own pattern. After spending time in the classroom and discussing this particular issue with the regular classroom teacher, I realized the cutting and pasting I expected as part of the test was too much of a challenge for this class. The pre-test was administered in small groups. At the end of the 2-week unit, I administered the same test as a post-test to see if there were any improvements from the pre-test. The post-test was also administered in small groups and with the same directions used in the pre-test. The pre-test/post-test is contained in Appendix A.

Findings from both tests indicate that students were able to recognize specific patterns, but had difficulties with filling in the blanks in the middle of a pattern. The post-test also indicated that students had an easier time creating patterns on their own.

At this point, I must address the test itself. After spending time in the classroom, I quickly realized that, in designing the test, I had been more concerned with the test itself than with the ability of the students in this particular class, or the time it would take to complete the test as I had set it up. I decided not to change the actual test, but to change the

way I expected students to complete the test. Originally, each student would have been expected to cut and paste a picture of the shape that would be next for each of the five given patterns. Each student would be given a copy of the test, plus two sheets of paper with pictures from each of the five given patterns on the test. This would have been extremely confusing for most of the students in the class (although I predict a few would have been able to complete the assignment as originally planned) and time-consuming, as well. After spending time with this particular class, I decided to administer the test by handing out the test and having students either draw or circle the shape that would be next in the pattern. After administering the test, I am sure I made the right decision in changing how the test was to be completed by students.

I chose to do this project on patterns because the kindergarten class was studying patterns at the time I was to be in their classroom. I have come to realize that the students were just being introduced to patterns, and were not completely familiar with the whole concept of patterns. They were comfortable with naming the pattern they were using for each month's calendar, but they did not have much experience with creating or continuing patterns on their own. Looking back, I should have focused more of my unit on filling in missing pieces of a pattern, and being able to recognize patterns outside the realm of shapes and alphabet.

The value of the pre-test/post-test to the students was that it gave them a sense of what to expect with my lessons. The value of the tests to me was that it gave me a starting point from which to start my unit, and an idea of where students were at the end of the unit.

My pre-test/post-test was a bit challenging for this particular class, as they required a great deal of help with understanding what was expected for the completion of each

pattern. If I were to re-do this project, I would try to make the test easier to understand and more appropriate to what students had covered, or were being introduced to, at the time of the test. Pre-test and post-test results are presented in Figure 1.

Analysis of the Results of the Pre-test

There were 19 students in this class; 3 were absent the day the pre-test was administered. Of the 16 students participating, only 1 was able to complete the entire test correctly. Most students appeared to understand the concept of the first two patterns (one dealt with circles and squares, and the other was the ABB pattern) and the fifth pattern (dealt with numbers), but after that, most students had difficulties with the remaining two patterns. The last item on the test asked students to create their own pattern. Of the 16 participating students, only 8 were able to do so.

Analysis by Item Number

1. 13 able to continue or copy pattern
2. 15 able to continue or copy pattern
3. 9 able to continue or copy pattern
4. 7 able to continue or copy pattern
5. 13 able to continue or copy pattern
6. 8 able to create a pattern on their own

In administering the pre-test, it was obvious that students were familiar with the circle and square pattern, as well as the ABB pattern. It was also clear that students were not familiar with having to fill in a pattern, as in A B C _ A _ C D _ B C D A B _ D. With the fifth pattern, I was testing to see if students would see the pattern of adding another zero as they continued the pattern, but most of them simply copied the pattern, and I decided to accept both answers.

Analysis of Results of the Post-test

Three students were absent the day I administered the post-test. As with the pre-test students were comfortable with the circle and square pattern, as well as the ABB pattern. As a group, they also did well with the number pattern. There were only two areas that showed improvement from the pre-test: (a) the item dealing with filling in the blank had an improvement of one, and (b) the item asking students to create their own pattern increased by four.

ANALYSIS BY ITEM NUMBER

1. 13 able to create or copy pattern
2. 15 able to create or copy pattern
3. 9 able to create or copy pattern
4. 8 able to create or copy pattern
5. 13 able to create or copy pattern
6. 12 able to create a pattern on their own

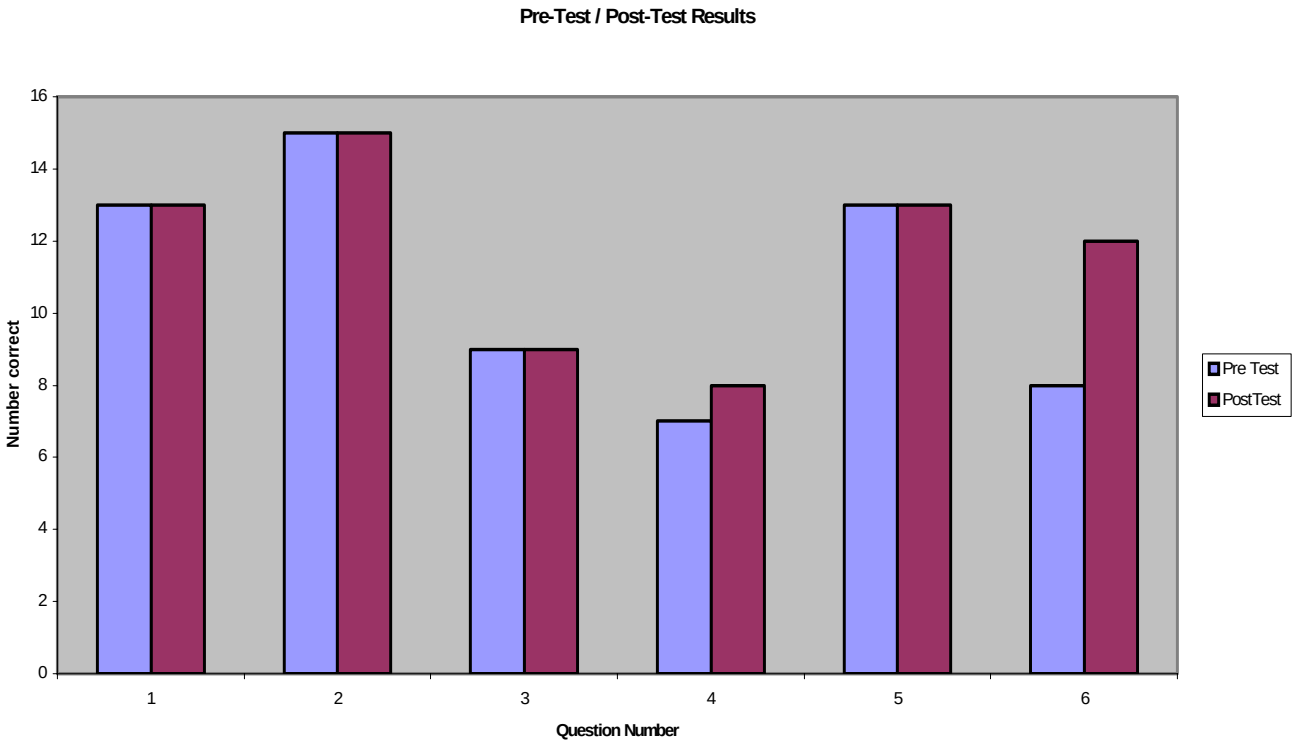

Figure 1. Pre-test and post-test results of kindergarten students completing patterns.

Conclusions and Recommendations

This study revealed that, although the study of patterns is important to young students' mathematical understanding, the pre-test/post-test I administered was not appropriate for this particular group. The kindergarten students appeared to have a general understanding of the concept of patterns when being led by the teacher, but when asked to work on patterns independently, they were overwhelmed, and, therefore, required a great deal of help in completing the pre-test and post-test.

The general consensus of mathematics teachers is that it is imperative for students to understand the connections made by or caused by patterning. Patterns can lead to discussions of how and why things happen with numbers, concepts, and ideas. It is important that kindergarten students begin identifying patterns with shapes, colors, and

building blocks. Being able to identify patterns gives students the opportunity to expand and explore the pattern, and at the same time give thought to why the pattern exists.

I would recommend the concept of patterns be introduced early in the school year to kindergarteners, and be discussed throughout the year as opposed to introducing it as one unit of study for a specific time period in the school schedule. If students are taught to look for patterns in their environment, and not simply presented with set patterns, they will become aware of the role patterns play in their surroundings. When young students are comfortable with any concept, they will eagerly move on and look for ways to expand what they know or want to know about the concept.

In researching grant money, I found several sites that offer grants for promoting mathematics learning in the classroom, but nothing specifically relating to patterns. With some creativity and hard work, grant money might be available through more general mathematics grants to help in promoting the study of mathematical patterns in the classroom.

The computer would be an excellent source of practice with patterning in the kindergarten classroom. There are many sites available with interactive pattern games that would allow students to work at their own pace and in ways that are comfortable to them. Websites like funschool.com, primarygames.com, and sesameworkshop.org are only a few sites students can go to for help with pattern practice. For students who are at the beginning stages of understanding pattern relations, these games would provide the opportunity to try to figure out the pattern, but would also correct the pattern, if necessary, so that the student could actually see each pattern correctly before moving on and trying

again. Many website pattern games progressively get more complicated so that students who are more advanced would also be challenged at the computer.

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Appendix A
Pre-test and Post-test

Name _____

Do you see a pattern?

1)

_____

2)

A B B A B B

_____

3)

CIRCLE THE KITE THAT COMES NEXT IN THE PATTERN

4)
A B C ____ A ____ C D ____ B C D A B ___ D

5)

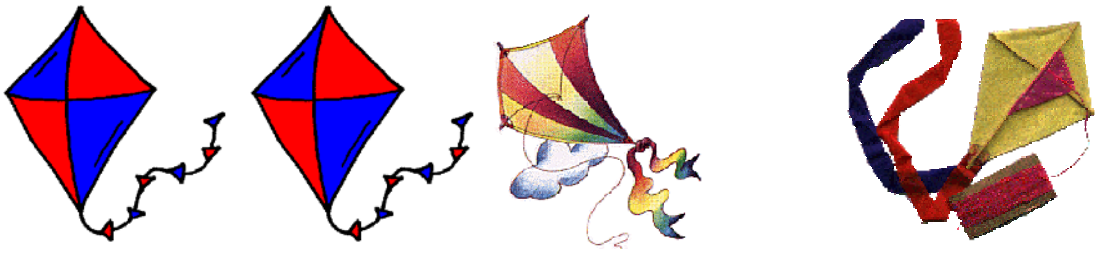
10, 100, 1000, _____, _____

6) **Create your own pattern in the space below!**

CUT AND PASTE TO CONTINUE PATTERNS…….

A A A A A A

B B B B B B



A A A B B B

C C C D D D

1000 **10000** **100000**

1000000 **10000000** **100**



Appendix B

Parental Consent Form

I, _____ give permission for my child
Parent/Guardian's Name

_____ to participate in a research project to be carried out
Child's Name

by an education student from the University of Tennessee at Chattanooga.

This research will consist of my child learning about patterns over a two-week period. The purpose of this research is to determine if kindergarten students are able to recognize patterns, continue patterns, and create new patterns. My child's name will remain anonymous.

If there are any questions or concerns about this study, please feel free to contact Mrs. Newberry at Brown Academy, (423) 209-5760.

Signature_____ Date_____

Appendix C

Student Assent Form

I, _____ am willing to participate in
Student's Name

a research project to be carried out by an education student from the University of Tennessee at Chattanooga.

This research will consist of me learning about patterns over a two-week period. The purpose of this research is to determine if kindergarten students are able to recognize patterns, continue patterns, and create new patterns. My name will remain anonymous.

Signature_____ Date_____

The Effects of Participation in an Electronic Pen Pal Project on Second Graders' Writing Achievement

Paula Rich
The University of Tennessee at Chattanooga

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-009.

Introduction

A major function of public school education is to help students learn to become effective writers. Proponents of all sides of educational philosophies agree at least that students should learn to write to communicate effectively during their 13 years in school. As teachers of writing and literacy, elementary educators have long sought for effective techniques and activities to foster students' writing abilities.

As schools install more and more classroom computers and urge teachers to use the new technology with their students, a growing need for simple, effective strategies to accomplish this purpose becomes increasingly apparent. Many classroom computers now go unused or misused for a wide variety of reasons (McKenzie, 1998). Until the effectiveness of using computers on student achievement is proven, many classroom teachers will remain reluctant to embrace this new technology. Since the classroom teacher is the major figure responsible for integrating computer technology into the curriculum, the need for research on the effectiveness of computer technology in classroom instruction is paramount. Using the classroom computer and Internet connection to conduct an Internet pen pal project might be one effective use of technology in the classroom to increase students' writing achievement. As action researchers, educators need to research this technique, and, if proven effective, implement it throughout language arts classrooms.

This study will investigate the impact of one use of computer technology in the writing classroom: an electronic pen pal project. While pen pal projects have been used by writing teachers throughout the past century, classroom computers and the Internet and email now make this project more accessible to teachers and students than ever before. As the Internet has shrunk our world in the past 5 years, its potential to link students from distant regions has yet to be fully explored. This study will determine the effect, if any, of participating in an electronic pen pal project on second-grade students' writing achievement.

Review of Literature

For the past 20 years, school systems have rushed to put computer hardware, software, and networks into schools in the hopes that this new technology will dramatically improve student achievement in all areas. Charter schools and magnet schools across the country have designed their whole curriculum around technology in the past 5 years.

At the same time, whole literacy proponents have been urging teachers to give students real, relevant, and meaningful reading and writing tasks. Writers' workshops and portfolio assessment have become almost commonplace in the typical elementary school classroom of the new millennium. According to whole literacy and constructivist proponents, student reading and writing achievement increases substantially when students are given meaningful reading and writing tasks with a real audience (Au & Carroll, 1997).

Like the wave of educational television of the 1960's and 1970's, however, many of the promises of computer technology have not been proven. Studies of the effects of computer technology on student achievement have shown mixed results. Several studies have shown no statistically significant effect on student achievement (Dybdahl, Shaw, & Blahous, 1997; Lichtenstein, 1996; Kacer & Craig, 1999). Other recent studies have actually shown a decline in student writing achievement when students use computers during reading and writing instruction (Pisapia, Knutson, & Coukos, 1999; Whitehead, 1999). Finally, some studies have shown the mitigating effects of lack of technology and support on the full implementation of computer use in the classroom (Beyer, 1992; McKenzie, 1998).

Several recent studies have shown the effectiveness of pen pal projects between elementary school students and university students in teacher education programs (Austin, 2000; Berrill & Gall, 1999; Niday & Campbell, 2000). These pen pal projects, both with email and traditional snail mail, have shown benefits for all students, even those with disabilities in written expression (Trollinger & Slavkin, 1999). Patricia Austin paired preservice teachers in a college children's literature class with third and fourth grade students in a local school. The semester-long pen pal exchange allowed students from both schools to learn "about books, about themselves, and about one another" (2000, p. 273).

In addition to pairing of student to preservice teachers, many schools have begun to explore pen pal projects with peer to peer classrooms of students in distant geographic locations. While class-to-class email pen pal projects abound on the Internet, a review of the research literature reveals a significant lack of research proving the effectiveness or ineffectiveness of this technique.

Indeed, many recent studies of technology in the classroom have failed to show positive students gains in achievement. In a 3-year computer initiative, a school district of 44,000 students recently invested in five computers and an inkjet printer for each elementary classroom

in 34 schools. After 3 years, reading achievement scores increased, but mathematics and writing scores did not. Even the reading scores could have been influenced by intervening factors not measured in the study, according to the researchers (Pisapia, Knutson, & Coukos, 1999).

An evaluation of technology in middle schools across the state of Kentucky, conducted by the Kentucky Institute for Education Research, revealed a positive correlation between achievement gains posted by students and the degree of technology implementation in schools. The researchers could not determine, however, whether the gains were a function of the implementation of technology, or merely the school's willingness to implement educational reforms (Kacer & Craig, 1999).

In a 1996 study, Nora Lichtenstein investigated the effect of word processing on the quality of 32 fifth-grade students' writing. Based on holistic scoring of a pre-treatment and a post-treatment writing sample, Lichtenstein failed to find statistical evidence of a significant achievement gain by students who used computers to write. Lichetenstein asserts that if the study had been conducted over a longer period of time, "the experimental sample that used computers may have shown more significant gains over the control group" (1996, Abstract). She concludes that her study, "along with other studies previously conducted, does not provide statistical evidence for the advantage of writing on a computer over traditional methods" (1996, Abstract).

Finally, in a study entitled *The Impact of the Computer on Writing; No Simple Answers*, Claudia Dybdahl, Donna Shaw, and Emily Blahous investigated whether fifth graders who compose on the computer write longer expository texts than those who write by hand. Results of the study indicate that the computer alone did not lead to longer texts nor highly proficient writing by students (1997).

While recent studies have failed to show achievement gains through using technology in the writing classroom, at least one study has shown a positive affective response among students. A statewide study in Delaware of middle school students showed that students enjoyed writing more when using computer in conjunction with their normal writing instruction and that students enjoyed using computers for learning and practicing their writing skills (Beyer, 1992). A 2000 study of 16 fifth-grade students failed to show a statistical gain in length for students who wrote journal entries on the computer, but did show that "using a word processor greatly increases interest in the activity" (Padgett, 2000, p. 6). According to the author, "Due to the increase in

interest, a student with a written expression deficit would benefit from this opportunity" (2000, p. 6).

Data Collection and Results

This research project was designed to test the hypothesis that students who participated in an electronic pen pal project would have higher achievement scores on a writing sample than students who did not participate in an electronic pen pal project.

The null hypothesis stated that students who participated in an electronic pen pal project would not have higher achievement scores on a writing sample than students who did not participate in an electronic pen pal project.

The operational definition of electronic pen pal, for this study, was a peer in another geographical location that was located using the Internet. Students communicated through hand-written letters. Students were deliberately paired with students from different cultural backgrounds and socioeconomic status. The experimental group attended an inner city school in Tennessee, where the majority of students (over 80%) were African American and from low socioeconomic homes. The pen pals attended a suburban school in Georgia, where the majority (over 95%) of students were Caucasian. The students in the suburban school were split fairly equally between middle class and lower socioeconomic homes.

The operational definition of writing achievement for this study was a measure of student performance on a given writing task according to the Developmental Stage/Scoring Guidelines for the Georgia Writing Assessment for Grade 3 (Georgia Department of Education, 1991).

The research was quasi-experimental in design. I used a nonequivalent control group design approach, using two existing classes of second-grade students. I secured permission from the building administrator and two second-grade teachers to work with their classes. I also had students take letters home to parents informing them of the nature of the project and giving them the option to not allow their student to participate in the project.

For the pre-treatment assessment, I had all students in the two classes write a letter to their principal during a 50-minute class period. I then had two third-grade teachers score the writing samples using the Developmental Stage/Scoring Guidelines Georgia Writing Assessment for Grade 3 to establish a baseline for each group.

While the rubric represents a holistic scoring system, and was thus subject to weaknesses in interrater reliability, it is the state-mandated measure of writing achievement for second-grade

students in Georgia, and all third-grade teachers receive training in how to score their own students' writing samples using the rubric during the school year. The rubric was created by a committee of teachers, administrators, and curriculum specialists from the state of Georgia, and is generally accepted as having fairly high validity in measuring students' writing achievement. Reports on the state-mandated assessment are scored and reported by the classroom teacher, using representative samples of each student's writing.

Two teachers scored each pre-treatment writing sample in the two groups. Any sample that received different scores from the two teachers were then scored by a third teacher and the score that was assigned by two out of three evaluators was used for the research.

For the 4-week treatment period, I had one experimental class spend approximately 25 minutes twice per week participating in a pen pal project with a class from a suburban Georgia school that we contacted via the Internet web site *Epals* (2003). Students hand wrote the letters, and then I hand-delivered them twice per week. While I had hoped to have the letters typed and transmitted via email twice per week, time constraints and the relative closeness of the other classroom made hand delivering the letters a more expedient way to facilitate the project. A further complication to having the students type and send letters via email was the lack of computers in the classroom, a low level of keyboarding skills among students, and a school district security policy that did not allow students to have individual email accounts in the Georgia school.

The control group class spent an equal amount of time each week writing letters to real people (teachers, janitors, parents) within the school. None of the control group letters were delivered. Responses from control group letters were not sought.

At the end of the 4-week treatment period, I had all students in the two classes write a letter to the superintendent during a 50-minute class period. I had the same two teachers score the writing samples using the same rubric.

I then compared the scores on the pre-treatment writing samples using a one-tailed t-test to determine whether the students in the experimental group had statistically significant higher scores than the control group on the post-treatment writing samples. In the experimental group, students' affective responses to the electronic pen pal project were also analyzed via pre-treatment and post-treatment interviews with five randomly-selected class members. Finally, the length of students' letters in the experimental group were analyzed each week.

Pre-treatment and post-treatment writing samples were collected approximately 1 month apart. Samples were only collected in the inner city school in Tennessee, since this study did not attempt to measure the affects of the pen pal project on the students in the classroom to which students sent letters. A total of 18 second grade students participated in the project in the experimental group. The results from the experimental group are presented in Figure 1.

Student	Pre-Treatment Score	Post-Treatment Score	Gain
1	2	4	+2
2	2	absent	n/a
3	3	3	0
4	3	5	+2
5	3	6	+3
6	1	3	+2
7	3	4	+1
8	1	absent	n/a
9	3	3	0
10	1	3	+2
11	1	2	+1
12	2	3	+1
13	2	2	0
14	3	3	0
15	2	4	+2
16	2	2	0
17	2	3	+1
18	2	4	+2
Mean Score	2.1875	3.375	+1.1875

Figure 1. Experimental group (range is 1 to 6).

A total of two students were absent from the experimental group during the administration of the post-treatment assessment. Their scores were dropped from the study and not used in calculating the mean score and mean gain.

A total of 19 second-grade students participated in the project in the control group. The scores from the control group are presented in the Figure 2.

Student	Pre-Treatment Score	Post-Treatment Score	Gain
19	2	3	+1
20	4	5	+1
21	2	2	0
22	3	2	-1
23	2	2	0
24	4 (not included)	absent	n/a
25	1	1	0
26	3	3	0
27	1	1	0
28	3	2	-1
29	2	3	+1
30	1	1	0
31	4	5	+1
32	2	3	+1
33	1	3	+2
34	1 (not included)	absent	n/a
35	3	4	+1
36	1	3	+2
37	3 (not included)	absent	n/a
Mean Scores	2.235	2.529	+.294

Figure 2. Control group (range is 1 to 6).

A total of three students were absent from the experimental group during the administration of the post-treatment assessment. Their scores were dropped from the study and not used in calculating the mean score and mean gain.

Using a one-tailed t-test, with an alpha level of 0.05 and a beta level of 0.01, I compared the mean gains from the experimental group and the control group. The number of student scores in the experimental and control groups were 16 each. The value of t was 0.8935 with df=30. I

thus concluded that my hypothesis that students who participate in an electronic pen pal project will have higher achievement scores on a writing sample than students who do not participate in an electronic pen pal project was disproved.

I also conducted interviews with five students in each group at the conclusion of the project. These interviews were an attempt to analyze the affective effects of the pen pal project on students. Open-ended questions were used, and the results are, therefore, descriptive in nature.

All five of the students in the experimental group stated that they liked writing. Only two of the five students in the control group stated that they liked writing. Of the two, one planned to write to her grandmother during the summer. Both students who expressed interest in writing in the control group stated that they liked to write stories. In the experimental group, four of the five students stated that they liked writing letters very much, while one stated that he thought it was "okay." All five students in the control group stated that they did not enjoy writing letters, making comments such as, "It was boring," and "I am tired of writing those letters every time."

In the experimental group, all five students stated that they would probably write letters to someone in the next year and as an adult. Four of the five stated that they wanted to write to pen pals in the next year and as an adult. One of the five stated that he would like to write to a pen pal, but that he would probably not have time to write as an adult. When asked why he would not have time to write, he stated that he would probably be busy working. In the control group, one of five students stated that she would probably write to her grandmother over the summer, and continue writing to family members as an adult. The other four students in the control group stated that they did not think they would write letters in the next year, although one student stated that she would probably write letters as an adult to her friends from school.

In the experimental group, all five students stated that they felt that they had learned a lot about how to write letters during the project. Two of the five students stated that they had learned many facts about their pen pal, and were interested in meeting him or her in person. In the control group, none of the five students stated that they had learned a lot about letters. Three of the five students admitted that they had learned the correct way to write a letter.

In the experimental group, all five students stated that they would like to write to a pen pal in another country. In the control group, four of five students stated that they would like to write to a pen pal in another country. Three of five students in the experimental group and two of five students in the control group stated that they had access to a computer with the Internet in

their house or apartment. One of the students in the control group stated that he used the computers at the public library to access the Internet at least one time per month.

Finally, anecdotal evidence suggests a level of interest in writing letters among students in the experimental group. Students usually had daily questions about when they were going to get to write letters, and if responses to their letters had been received. Students in the control group often met the letter writing session with groans, and questions like, “Do we have to write another letter?”

Conclusions and Recommendations

While the statistical effects of participation in the pen pal project showed no significant difference in students’ writing achievement, several affective measures suggest a higher level of motivation to write letters among students in the experimental group.

The lack of statistically significant gains could be attributed to several factors. First, the project lasted a relatively short period of time. Since writing improves on a developmental continuum, significant gains in writing achievement often take months, or even years to accomplish. A longer electronic pen pal project, lasting over a semester or school year, is needed to determine if students would make statistically significant writing achievement gains. Another factor that may have affected the study was the limited access to technology. While students in the two schools were culturally distant, writing to pen pals in another country may have been more intrinsically motivating for students in the experimental group. Due to the relatively short nature of the study, the lack of a computer lab where all students could write letters at the same time, and a district-wide ban on student email accounts, a nearby classroom was chosen for participation in the study, and letters were hand-delivered twice per week. If students could write to pen pals in another country from a computer, the project might be less cumbersome to the classroom teacher and writing achievement might increase significantly. Finally, the relatively low number of students participating in the study may have affected the outcome. Further studies need to be done involving multiple classrooms in several different schools.

Several grants are available for studies of this kind. Grants include the Kelly Gene Cook, Sr. Charitable Foundation Teacher Grant Program; Teaching Tolerance Grants; The Starbucks Foundation Power of Literacy and Leaders in Diversity Grants; and the Entergy Charitable Foundation Grant (EBR Parish Schools Community Network, 2004). The National Council of

Teachers of English (1998), has currently suspended all of its research-based grants, so funding for further studies is unavailable from this source.

Students' responses to affective questions, and their spontaneous comments and questions about the pen pal project, suggest a high level of interest in writing letters among the experimental group. While students may not have practiced writing letters enough to make statistical gains in writing achievement, these affective results are promising indicators that an electronic pen pal project might be a useful teaching strategy to motivate students to practice writing. Notably, all the students in the experimental group planned to write letters to pen pals over the next year. As students actively engage in the task of writing more often, even beyond the bounds of the school campus and academic year, they may improve their writing achievement through practice. Finally, writing to peers in other countries may allow students to engage in the "mastering of multiple social discourses [which] allows for increased power and access to opportunity—one of the major intents of literacy education" (Egawa, 1998, paragraph 7).

In past years, the costs in time and money of locating pen pals and sending letters regularly may have prohibited some teachers from allowing students this educational opportunity. With the introduction of Internet-connected computers into most schools and classrooms in the United States, a free, electronic pen pal project becomes a real possibility for students. While the Internet opens up a myriad of opportunities for our students, it will remain a wasted resource as long as it is relegated to a source of games for students who have completed their "real schoolwork." Teachers in preservice programs need to learn how to effectively integrate the Internet into their classroom. The possibilities for learning to use written discourse for social interaction, and to learn about other cultures, could make learning to allow students to use email in the classroom a valuable technique for all teachers.

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Appendix A
Interview Questions for Electronic Pen Pal Participants

1. Do you like to write?

2. What kinds of writing do you like to do? (write stories, poems, songs, etc.)

3. Do you like writing letters? Why or why not?

4. Do you think that you will write letters to someone in the next year? If so, who?

5. Do you think that you will write letters to someone as an adult? If so, who?

6. What did you learn from writing letters over the past few weeks?

7. Would you like to write to a pen pal in another country sometime?

8. Do you have a computer with the Internet at your house or apartment?

Using Games in the Classroom to Enhance

Motivation, Participation, and Retention:

A Pre-test and Post-test Evaluation

Xiomara Romine

The University of Tennessee at Chattanooga

EDUC 590

Spring 2004

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-023.

Introduction

During the first placement of my student teaching, I discussed with my cooperating teacher many of the problems that face teachers today. During the discussion, she expressed how challenging it can be to find ways in which to motivate students to learn. She said that, often times, students do not choose to participate in the class discussions, thus weakening their ability to learn and retain new information. In researching this topic, I found that many educators feel that the use of games in the classroom can improve motivation, participation, and retention of students. Therefore, I decided to test this theory by evaluating a pre-test/post-test learning assessment to see if games based on classroom content can improve overall scores.

Review of Literature

I began my research with the belief that student motivation can increase through the use of games to reinforce classroom concepts and aid in retention. Most of the research I found centered on the use of games in ELS classrooms and in the teaching of mathematical concepts. In reading these articles, I found that games are not only useful in these areas but, generally, can be used to teach a variety of subjects.

The justification for using games in the classroom has been well demonstrated and documented. Games help and encourage many learners to sustain their interest and work. (Wright, Betteridge, & Buckby, 1984). One of the biggest problems facing teachers is how to get students excited about learning. Games are highly motivating since they are amusing and, at the same time, challenging. Furthermore, they employ meaningful and useful language and encourage and increase cooperation (Ersoz, 2000). In the article "Creative Games for the Language Class," Lee Su Kim (1995) lists some of the many advantages of using games in the classroom:

3. Games are a welcome break from the usual routine.
4. Games are motivating and challenging.
5. Games help students to make and sustain the effort of learning.

4. Games provide language practices in the various skills - speaking, writing, listening, and reading.
5. Games encourage students to interact and communicate
6. Games create a meaningful context for learning content

Usually, it is perceived that learning should be a serious matter. It is not common for teachers to try to make their students laugh and play during learning. It is, therefore, important for educators to understand that games have been shown to have advantages and effectiveness on learning that is hard to achieve in other ways. First, games bring in relaxation and fun for students which makes it easier to learn new concepts. Second, games usually involve friendly competition which is motivation for students to be involved (Huyen & Nga, 2003). Their research shows that games are used not only for mere fun, but, more importantly, for the practice and review of lessons, thus leading toward the goal of improving learners' competence (Huyen & Nga, 2003).

Other researchers agree that games in the classroom are beneficial. When asked directly about why to use games in the classroom, researchers in Japan responded "Games are fun and children like to play them. Games add variation to a lesson and increases motivation by providing a plausible incentive to (learn). Through games children experiment, discover, and interact with their environment" (Silvers, 1982).

The justification for using games in the classroom has been well demonstrated as benefiting students in a variety of ways. These benefits range from cognitive aspects of language learning to more cooperative group dynamics (Lengeling-Malarcher, 1997). Unfortunately, choosing the correct game for the classroom is not as simple as it sounds. Care should be given to the selection so that the game can successfully achieve its goals. Teachers should consider the following factors while planning the use of a game: classroom space, noise, materials necessary for the game, and the amount of time needed for the game. Also under consideration should be the level, culture, interests, and age of the students (Lengeling-Malarcher, 1997). Some specific guidelines to keep in mind (Me & Yu-jing, 2000):

1. A game should be more than fun.
2. A game should involve “friendly” competition.
3. A game should keep all of the students involve and interested.
4. A game should encourage students to focus on the content involved.
5. A game should give students a chance to learn, practice, or review.

The social aspect of games should also not be overlooked. Playing games is a very social .activity. Games give the students a chance to engage in social behaviors they otherwise might not have a chance to learn. Holt (1996) talks about the advantages of the atmosphere surrounding a group of students playing games together. Playing games will foster a community atmosphere and encourage teamwork. This can be true of any game where teams are used, and most games can be adapted to allow for teams of two or more. Even though the students are competing, they are also using teamwork. To play games, students need to work together and often must be fair and polite. Even if they are trying to beat their opponent at the task required of the game, they are still working with their opponent to actually play the game. Also, games can reduce the social hierarchies. Students all start on the same level, and if the game is fair, they all have an equal chance to win the game. Your social status outside the game is not a factor.

Even with all of these benefits, games should not be the only method of instruction used. Lectures, discussions and other traditional classroom activities still play an important part in education and should not be passed up for the exclusive use of games. Games are not always the best method of teaching everything. Used in conjunction with other methods, games can keep students engaged and help them to develop a more in-depth knowledge of the topics they cover.

Data Collection and Results

Research Question

The question at hand is whether or not the playing of games in the classroom can improve motivation, participation, and retention in students. The method for analysis will be a pre-test and post-test given to determine if knowledge is gained after playing the game, and, if so, is this knowledge greater than that learned through other conventional methods of teaching.

Participants

The students involved in the study are fourth graders in an urban magnet school. The study involves three classes of fourth graders. All three classes will be given a pre-test to determine their prior knowledge of the selected topic. All classes will then be taught the lesson using a combination of direct instruction and class discussion. During the next class period, all three classes will be reviewed over the subject matter. Two of the classes will receive this review through class discussion using questions and answers. The other class will participate in a game as the method of review. All three classes will then be given the post-test during a later class period. Results will then be assessed to see if the latter group had the most gains in the areas of motivation, participation, and retention.

Procedure

I implemented this study during the first placement of my student teaching. I chose to work with the fourth grade because the students were starting a new unit on a subject that was not familiar to them: the rainforest. I therefore created a pre-test based on information regarding the rainforest, the native people, and rainsticks (chosen as the art project to accompany the rainforest unit). The pre-test/ post-test consist of 15 questions with 5 being true/ false, 4 being fill-in-the-blank, and 6 being matching.

I gave the students the pre-test on the first day that I was to start the rainforest lesson. I briefly explained to the students that the purpose of the pre-test was to determine their prior knowledge. I also explained that no grade was to be given but that they still needed to do their best. I told the students that all questions should be answered and, that, if they did not know an answer, then they should choose the one they felt was the best. I then gave the students approximately 15 minutes to complete the test.

After the pre-test, I talked to the students about the rainforest. I showed them pictures and graphs that explored the different layers of strata. I asked open-ended questions and also more specific questions to start a class discussion. Specific questions included: Do you think it rains a

lot in the rainforest? Do you think it is very hot or very cold in the rainforest? What kind of animals do you think live in the rainforest? Do you think you would like it in the rainforest? etc. During the lecture/discussion, I made sure to cover the material in the pre-test/post-test.

At the beginning of the next class period, I reviewed the material that we had covered the previous week. For two of the class periods, the review was done through a series of questions and answers. In both of these classes, students were asked specific questions, and I called on students who raised their hands for the answers. During the course of the questioning, I tried not to call on the same student twice unless no one else was raising their hand. I noticed, in both of the classes, that approximately 30% of the students were raising their hands for most of the questions. Another 30% would raise their hands sporadically, choosing carefully the questions for which they felt they knew the answers. Another 40% of the class did not try to answer questions at all, choosing instead to listen quietly. The final class that I met with in the second week were introduced to a game as their method of review. The rules for the game were explained at the beginning of class. I told the students that we would be playing a game on the facts we had learned about the rainforest, and then split the class into two equal teams. I told them that I would be asking a question to each team, and that each side would then be given three chances to answer the question. If they answered correctly, then they would get the point. If they failed to answer correctly, then the question would be asked to the other team and they would have a chance to get the point.

Before the start of the session, I had asked my cooperating teacher to observe the lesson and take notes to see her observations on how successful the game had been. I kept score on the dry erase board, and made sure to ask an equal number of questions. I could immediately tell that the kids were excited about being able to play a game. For each question, the majority of hands were raised and the children encouraged each other when answering. Because each side had three chances to answer correctly, no one student would be blamed for losing the point for their team. This seemed to encourage students to try answers even if they were not sure of them. I made sure to ask questions that covered material on the test as well as other items that were

discussed in class. Fortunately, for me, both teams did really well and ended up in a tie. The students were very excited by the results and had tried hard to remember the correct answer for their team. After the class was over, my cooperating teacher explained her observations. She said that she felt the game had gone very well. She felt the majority of the students seemed very engaged in the activity and said that she could see a difference in their effort as compared to those who just participated in the class discussion. We then began to construct our rainsticks for the remainder of the class period.

The post-test was given out to all three classes during the third week of the rainforest lesson. Once again, I explained to the students that they would be taking a test to see what they now knew about the rainforest. I told them to try their best and to make sure they did not leave any questions blank. I then gave the students approximately 15 minutes to complete the post-test. I noticed immediately, in all three classes, that the students appeared to finish a lot faster and also seemed more confident about their choices than they had been during the pre-test.

Data Analysis

The first class to take the pre-test was Group A. During the class period, 22 tests were taken for a total of 330 questions. Of these 330 questions, the class missed 107. The percentage of questions incorrect was 32.4%. Their method of review after being introduced to the lesson was to participate in a class discussion. On the post-test, 21 tests were taken for a total of 315 questions. Of these 315 questions, the class missed 62. The percentage of questions incorrect was 19.6%. That means that the class improved their scores by 12.8%.

The next class to take the pre-test was Group B. On the pre-test, 24 tests were taken for a total of 360 questions. Of the 330 questions, the class missed 163. The percentage of questions incorrect was 45.3%. Their method of review was also a class discussion. On the post-test, 20 tests were taken for a total of 300 questions. Of these 300 questions, only 39 were missed. The percentage of questions incorrect was 13%. That means that the class improved their scores by 32.3%.

The final class to take the pre-test was Group C. On the pre-test, 22 tests were taken for a total of 330 questions. Of the 330 questions, the class missed 159. The percentage of questions incorrect was 48.2%. Their method of review was to participate in a game. On the post-test, 22 tests were taken for a total of 330 questions. Of the 330 questions, the class missed 62. The percentage of questions incorrect was 18.8%. That means that the class improved their scores by 29.4%.

In analyzing the results, I, at first, could not understand why Group B improved their score by 32.3%, while Group C, who participated in the game, only improved by 29.4%. I wondered, then, if the use of the game was more effective than traditional methods. Upon closer look, I realized that there were several other factors to take into consideration. First, in the area of motivation and participation, Group C had shown a distinct increase. During the review of Class A and Class B, approximately 30% participated enthusiastically, 30% sporadically and 40% did not participate at all. This held true for both groups. For Group C, approximately 80% of the students were participating. The breakdown was 60% participating enthusiastically, 20% participated sporadically and 20% did not participate. This was a significant increase over the other classes. The students were very engaged in the activity, and even those that were not raising their hands to answer the question during the game were still interested in the activity and cheered on their teammates. Second, the scores of Class C did improve by almost 30%. This was a significant gain over Class A. This class improved their score by 12.8% which is significantly lower than Class C who had a 29.4% gain. Although Class B did about the same as Class C, there were social factors involved of which I was not aware. In this particular magnet school, inclusion students are all assigned to one class so that the resource teacher can meet with them all at once. This was the first time that I had encountered this particular set up. While discussing the results of my study with my cooperating teacher, I expressed my concern that the results showed such a close correlation between Group C and Group B. She then explained to me that the gains for Class C were truly significant because they are the inclusion class for the fourth grade. In this class, approximately 1/4 of the students function below grade level. Taking this

into consideration, it really is significant to see how motivated Class C was and to see the significant gain in the knowledge learned in comparing the pre-test to the post-test.

Conclusions and Recommendations

The research I did strongly suggests that games are an effective activity for teaching students. A classroom should be a place for fun, as well as a place for learning. Games motivate and entertain students and also aid in the retention and retrieval of the materials introduced. Because games are fun, students may not realize that they are actively participating in their own learning. Even if they do, they often will find the process enjoyable. Therefore, teachers should try to incorporate games and other fun activities into their classrooms in order to create the most engaging atmosphere possible. Increased motivation, reinforcement of skills, both academic and social, and a renewed interest in previously introduced topics will be the reward.

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Appendix A

4th Grade Pretest and Posttest

Rainforest/ Rainsticks

Circle true or false for the following questions:

1. Rainforest are important to the environment. T F
2. Rainforest get over 100 feet of rain each year. T F
3. Rainforest supply food, medicine, oxygen and clean water. T F
4. Tropical rainforest are always found near the equator of the earth. T F
5. Rainforest do not have many types of animal living that live there. T F

Fill in the blank with the correct answer:

emergent canopy understory forest floor

6. A dark, cool environment under the leaves but over the ground is called the _____.
7. Giant trees that are much higher than the average canopy height are included in the zone called _____.
8. This area includes the upper part of trees, it is a leafy environment full of life. It is called the _____.
9. This area houses the largest animals in the rainforest and the smallest (insects). It is called the _____.

Pick the best answer:

10. Rainforest are:

    a. dry, desert-like areas

b. the same as regular forests

c. very dense, warm, wet forests

11. The temperature in the rainforest is usually between:

a. 50-60 degrees Fahrenheit

b. 70-80 degrees Fahrenheit

c. 90-100 degrees Fahrenheit

12. The rainstick is:

a. a tube-shaped rattle that produces sound

b. a wooden stick from the rainforest

c. a cooking utensil used by people in the rainforest

13. Forest people are mostly:

a. farmers

b. traders

c. hunter-gatherers

14. Traditionally, rainsticks were made of:

a. leaves

b. cactus

c. cardboard

15. Natives believed that the rainstick could:

a. heal the sick

b. protect them from harm

c. make it rain

Elementary Inclusion

Education 590

Jennifer Shields
Spring 2004

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-062.

Introduction

Inclusion is a topic that has recently become a popular area for discussion and debate in the field of education and special education. Inclusion is the practice of schooling special-needs students in the same classrooms as other children (Cambanis, 2001). In an inclusion setting, children with disabilities are placed in general education classrooms, usually along with a special education aid to help the disabled child succeed in the class. The purpose of this paper is to investigate how prepared and how the regular educator feels about this process. Along with many other topics of special education, the topic of inclusion has been surrounded by uncertainty and controversy for as long as the concept has been around. This controversy may stem from the fact that inclusion is expensive and experts disagree about how much time disabled students should spend in regular classrooms (Cambanis, 2001). Although this topic is controversial, it cannot be ignored. Inclusion will, at some point, affect 1% of all children born each year, who will have disabilities and the families and educators with whom they will come in contact (Stainback, 1985).

There are two major federal laws that deal with the education of children with special needs. One of these laws is, The Individuals with Disabilities Education Act, also known as IDEA. This law passed in 1975, was the first act to guarantee all students with disabilities a public education (Kluth, Villa, & Thousand, 2002). This law requires that the school district supply an individualized education program (IEP) (Merritt, 2001), for every child with disabilities. This law also requires that the IEP team consider placing each child in the least restrictive environment possible. The least restrictive environment possible refers to the environment that would benefit the handicapped student the most, both academically and socially. The IEP team usually considers three possibilities for the student. One possibility is that of a self-contained classroom, where the student would be in a class with all disabled students and be taught by special education teachers. A second possibility is that the student be placed in a general education classroom for half of the day and a self-contained room for the other half. The third option is that the student be placed in a general education classroom for the entire school day with the help of a special education aid and any supplemental help or material the student may need to succeed in that class. This law sets the stage for inclusion by asking that, if at all possible, students with disabilities be educated with children who are not disabled (Kluth, Villa, & Thousand, 2002).

A second law dealing with special needs students is section 504 of the Rehabilitation Act of 1973. This act requires that schools which receive federal funding provide equal education to all handicapped children in the school's jurisdiction. This act also requires that handicapped children be educated with other children who are not handicapped, to the maximum extent. This requirement clearly points to inclusion as the best option available for handicapped students, in the opinion of the federal government. Section 504 has helped handicapped people in other areas, as well. The act requires that public buildings make architectural changes to increase accessibility for those with special needs (Choate, 1997). This part of the act was important because it put an end to the school using the structure of the school building as an excuse for providing an unequal education to those children who were handicapped or disabled. These two laws have proven to be successful in helping the parents of disabled children get their children into the general education classroom. In the case of Roncker v. Walter, in 1983, the parents of a disabled child wanted their child removed from a contained setting and placed in a general education classroom. The school district held that the contained setting was superior to that of an inclusive setting. The court took the side of the parents and ruled that the child should have the opportunity to be in the least restrictive setting, which would be a general education classroom. The court used the IDEA law stating that, if at all possible, children with special needs should not be segregated from the rest of the school community (Kluth, Villa, & Thousand, 2002).

This paper will explore the feelings and attitudes of elementary teachers in the Hamilton County area and answer many questions that need to be answered. Are teachers doing all they can do to help disabled students? Are teachers getting appropriate training and resources to do their job to the best of their ability? What else needs to be done?

Review of Literature

In researching inclusion in elementary schools, I found that pros and cons of inclusion dominated the available research. Although controversy surrounds the topic of inclusion, many educators and parents of disabled children often question whether inclusion really is the best option for their children. Many benefits have been associated with inclusion. Inclusion can provide opportunities for expanding social networks and forming new friendships (Mastropieri & Scruggs, 2001). Some studies suggest that a child with special needs may be able to greatly improve their social skills by being around children without disabilities for the majority, or all of the day (Choate, 1997). In a general education setting, the child with a disability will have the opportunity to interact with average children. This interaction may help the child become accepted by his or her peers, which will lead to higher self-esteem and confidence. Sandy Merritt, an inclusion teacher, who wrote an article in *Educational Leadership,* writes about two girls with disabilities that were in her class. She says that the class accepted these two girls and supported them in every way (Merritt, 2001). In her article, she continues with the social benefits of inclusion by saying that the entire class learned teamwork, acceptance, tolerance, and the meaning of community (Merritt, 2001).

Disabled students can also be positively affected by nonhandicapped students who display a higher frequency and more diverse and higher quality of social behaviors than would a classroom full of other handicapped students (Stainback, 1985). This means that disabled students could benefit from exposure to average children who could grow to be more accepting adults in the future, due to inclusion. Parents of special needs children have been interviewed in different studies and many say that they feel their special needs children will learn how to socialize better in a general education classroom (Palmer, Fuller, & Arora, 2001). Some parents

also feel that it is unfair to keep their children segregated from other children just because they are disabled. In one study, a parent was quoted as saying "I am adamantly opposed to any segregation by disability or ability because the situation created…is not representative of the society their children will live to grow up and eventually work in" (Palmer, Fuller, & Arora, 2001. p. 474).

Academic benefits of inclusion are also numerous. One of these benefits is that the disabled student would be taught the same material as the children in the general education class. When a special needs student is placed in a general education classroom, they are placed in this classroom with a special education aid. The job of this aid is to provide information about inclusion between the regular educators and the school community, starting inclusion activities in the classroom, helping the disabled students succeed and fit in, both socially and academically, and monitoring the disabled student's progress in the general education classroom (Stainback, 1985). The special education aid is a huge benefit to the disabled student. By providing supplemental classroom material and emotional support, this aid helps to make the child's transition easier and ensures stability and success for the disabled student. With the help of this aid, the disabled student is able to receive an education, as close to equal as possible, to that of any average student.

The opportunity for a disabled student to be involved in group projects or activities is also valuable. When disabled students are allowed to work in groups with average students, they may have an easier time comprehending the material and developing positive relationships with nonhandicapped peers (Stainback, 1985). In an interview with a parent of a disabled child, the parent stated that their child "is not progressing in a special education classroom because he is not challenged enough" (Palmer, Fuller, & Arora, 2001, p. 473). By working in a group with

average students, the disabled student may feel inspired and encouraged to work harder towards fully understanding the information provided in the class lessons. In her article in *Educational Leadership*, Sandy Merritt wrote about the drastic academic changes that occurred in the special needs students that were included in her classroom. At the beginning of the school year, her one disabled student was performing 2 to 3 years below her grade level. This disabled student had trouble reading and would often get frustrated and give up. Throughout the year, Merritt, the special education aid, this student, and this student's peers practiced reading and reviewing often. By the end of the year, the disabled student was reading emergent-level books (Merritt, 2001). This shows that a disabled student may benefit from being exposed to an average education in an inclusive setting where he or she is encouraged to progress. Another of Merritt's disabled students struggled with writing. She attempted to do all of the classroom writing activities with the other students but always had trouble using a pencil and usually ended up only writing straight lines, not words. This was frustrating for the student and the teacher, as well. The special education aid came up with the idea of allowing the disabled student to use a keyboard for writing instead of a pencil. With some practice, the disabled student learned to use the keyboard and could write successfully just like the average students in her class (Merritt, 2001). This example shows that the student deserved to be doing the same level of class work as her peers and that she truly could succeed in the average classroom. All she needed was a tool to help her physically to be able to put her thoughts down in the form of words.

Along with the numerous and varied benefits of inclusion, there are a number of areas of concern to both educators and parents of disabled children regarding this type of education for children with special needs. One concern with inclusion is that the student's peers or even the general education teacher, won't accept the disabled student. Disabled students who lack the

social skills needed to connect with other children and communicate effectively with adults may have a harder time adjusting to the inclusion setting. Research shows that teacher and/or nonhandicapped students have difficulty forming durable and positive social interactions with students who have moderate to severe disabilities (Stainback, 2001). That is why many experts feel that it is necessary to train the disabled students in social skills and activity before they enter the general education setting (Stainback, 2001). When parents were interviewed about their concerns, many stated that they were afraid of their child being rejected (Palmer, Fuller, & Arora, 2001). One parent said, "I would not like to submit my child to that, because children can be very cruel" and another parent stated, "I would also fear that curious students would possibly harm her or mistreat her" (Palmer, Fuller, & Arora, 2001, p. 477). While these concerns are prevalent and somewhat valid, other research has shown that training nonhandicapped students to interact with the disabled students can be extremely successful (Stainback, 2001). This research also indicates that positive interactions between the disabled and the nonhandicapped depend on the nonhandicapped students' understanding of the children with disabilities (Stainback, 2001). Many parents and educators are also concerned with the lack of individual attention that a disabled child may encounter in a general education setting (Palmer, Fuller, & Arora, 2001). Parents and educators feel that many public schools' general education classrooms are overcrowded, in general. They feel that placing a child with special needs would be adding too much stress to the classroom environment (Palmer, Fuller, & Arora, 2001). The concern with overcrowding also incorporates a concern that the disabled child may get "lost" in the crowd and not receive enough individual attention as necessary. Parents that were interviewed about this concern responded by saying, "…she needs a more nurturing environment than a public school teacher with thirty-two students could possibly provide" another parent said, "it is

widely recognized that these individuals (disabled students) require greater attention and in a fully inclusive situation this would never be possible, all would suffer" (Palmer, Fuller, & Arora, 2001. p. 476).

Many educators acknowledge these concerns and make the point that under IDEA, the Individuals with Disabilities Education Act, the disabled student should be placed in the least restrictive environment possible and educated to the extent appropriate. This means that the student has every right to be placed in an inclusionary setting if it is *appropriate* according to the disabled student's social and academic needs. The decision of whether it is appropriate for a student to participate in inclusion varies from student to student (Kluth, Villa, & Thousand, 2002). The concern over the lack of individual attention for the disabled student may be offset by the common practice and usual guideline of having a special education aid accompany every disabled student placed in an inclusionary setting. The job of this aid is to act as an advocate and planner for the disabled student (Stainback, 2001). It is the responsibility of the aid to measure the progress of the disabled student and communicate with the general education teacher, school official, and parents.

Many models and outlines exist for the implementation and planning of introducing inclusion to a public school setting on both the elementary and secondary level. Although many aspects of education are taken into consideration when implementing inclusion, there are several guidelines that appear to be common to many plans for inclusion.

One of these guidelines is the importance of administrative support (Mastropieri & Scruggs, 2001). For a program of inclusion to be successful, it is important that the school administration and board of education be actively aware and educated in the subject of inclusion so that they may be able to make informed decisions regarding its implementation. It is also

important that the administration understand the value of inclusion so that they may allocate appropriate resources for the program (Mastropieri & Scruggs, 2001). Another important factor for successful inclusion is the attitude of the general education teacher. Teachers of successful inclusive settings are noted for their positive attitude and acceptance of individual differences among their students (Mastropieri & Scruggs, 2001). It is important that the disabled student feels supported, welcome, and encouraged by the general education teacher. It is also vital that the nonhandicapped students be actively involved in the inclusion process (Mastropieri & Scruggs, 2001). Peers can be helpful to the disabled student by supporting the disabled child, tutoring, and helping the disabled student during group activities. By allowing the nonhandicapped students to help and/or work with the disabled student, both groups may benefit. The nonhandicapped students will learn to respect and accept the disabled student. The disabled student will benefit from the social interaction and may feel more involved in the class and more socially accepted by his or her peers. One final, yet important, guideline is that the general education teacher, the special education aid, the disabled child, and his or her parents meet several times before the beginning of the school year (Merritt, 2001). These meetings are important so that each party can be fully prepared and organized before school begins. It is also important that the disabled student and his or her teachers develop a trusting relationship. The transition into an inclusionary setting can be very stressful for both the student and teachers. If both parties are familiar and comfortable around one another it may lessen the trauma of the transition. Along with these guidelines, there are many other details that must be planned and discussed before inclusion can be implemented successfully.

Data Collection and Results

Purpose

The purpose of this case study is to gather information regarding the attitudes and education in which elementary teachers are using in the inclusion classrooms. The hope is to find the teachers are comfortable, well supported, highly trained, and excited about teaching in an inclusion classroom.

Procedure

Location

Copies of a single questionnaire (see Appendix A) were distributed to two different public elementary schools in Hamilton County. For purposes of anonymity, they will be known as School A and School B. These two schools were chosen because I did my student teaching at these schools and I am very familiar with the schools' procedures. Both schools are magnet schools, where diversity and meeting individual needs in a student-centered environment are of much importance. For the purposes of this study, it is important to note that both schools use inclusion as their special education model.

The Survey Instrument

The actual instrument consists of two sections of response questions. The first section asks for general information. The questionnaire does not ask for a name, just basic information such as degree earned, certification, year of graduation, grade level, how many years experience, and special education training. The second section asks about the teacher's experiences with inclusion in their classroom.

After each question, there is plenty of room for comments or details. Respondents were given 3 weeks to complete the questionnaire. The respondents were told to drop their questionnaire in a box in the front office to remain anonymous. Out of 20 surveys distributed, 14 were returned completed. All 14 were filled out by regular educators. Of the 14, 8 are UTC graduates, 6 of the UTC graduates have a Master's in Education. All of the respondents are elementary educators teaching in grades kindergarten through fourth grade.

Results

With regard to inclusive training these teachers received before entering the classroom, 10 of the 14 answered they had no special education classes or field experiences with students with disabilities. Four of them responded they at least had one special education class throughout their education. Eight of the 14 responded they had observed a classroom with disabilities and one responded they had been a tutor for a child with autism. Nine of the 14 had students in their classroom this year with some type of disability. Of the nine who answered yes, four were UTC graduates. One of the most important questions was the teacher's comfort level while teaching students with disabilities. The teachers were asked to rate their comfort from 1 through 10 with 1 being very uncomfortable. The overall average was 8. The final question was about the teacher's professional development training with special education; 8 of the 14 had some type of training during their employment.

Figure 1 shows the comfort level of each respondent. These results were very exciting. The mean comfort level is 6.7. The median comfort level is 7.5. These results show that teachers are very comfortable teaching students with disabilities in their classroom. This was exactly what I was hoping to find.

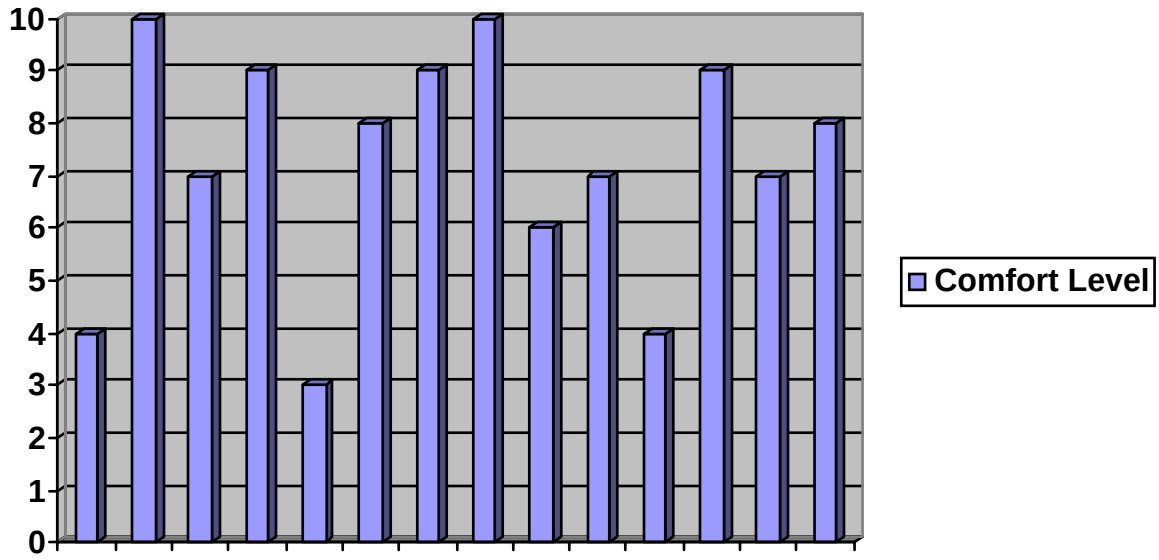

Figure1. Results of comfort level questionnaire.

Conclusions and Recommendations

The data collected shows that, regardless of training, teachers are teaching in inclusion classrooms and seem to be comfortable there. Throughout my research, I have observed that UTC graduates were more comfortable in teaching in inclusion classrooms. As a recent graduate, I know that I feel very prepared, myself, and ready to teach all types of diverse learners.

Although there are many pros and cons being researched on inclusion, I do not believe the answer is so clean cut. The best answer for now would be to take the issue of inclusion case-by-case, and sincerely do what is in the best interest of each student, academically and socially, not what seems “right” or “fair.” Many cases show that inclusion is beneficial, and I believe that, in every case possible, we should fully include disabled students in the general education classrooms. By far, the most important element of education is quality learning, and this cannot be compromised by desires for belonging. Every child should have a full range of options in

order to obtain an equal quality of education. Inclusion is becoming more popular than ever and teachers need to be prepared and excited about this change.

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Appendix A

Teacher Questionnaire

Dear Educators,

The following request for information has been developed in conjunction with my graduate research I am completing for UTC. I am researching the extent to which "regular education" teachers are prepared for integrating students with disabilities into their classrooms of mostly typically developing children.

Please fill out the following questions and return to the drop box provided in the office by April 1st. You do not need to add your name anywhere on this form, it is anonymous.

Jennifer Shields
Student Teacher

Your Certification_____.

University where you received training/certification_____.

Number of years of actual teaching_____.

Grade level you are teaching_____.

1. During your education, were you required to take any special education courses? If so, list their titles.

2. During your education, were there required field experiences in which you observed students with disabilities.

3. During your career as an educator, have you had students with disabilities or special needs in your classroom. What types of disabilities have you encountered and how did you modify your teaching to accommodate their needs.

4. Rate your comfort level regarding Inclusion on a scale of 1-10, where 1 is completely uncomfortable with students with disabilities in your class and 10 being completely comfortable. Describe why you rated yourself this way.

5. Have you had any seminars/professional development on Inclusion made available to you, have you attended?

Developing an Effective U.S. History Unit for First-Grade Students

By: Cindy H. Tahler
EDUC 590
Spring 2004

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-010.

Introduction

Statement of the Topic

"The creation of the United States of America is the greatest of all human adventures" (Johnson, 1997, p. 3). However, in the early elementary grades, too little time is devoted to students' education about their country, specifically the names of the states and certain significant geographic features associated with each state. One of the chief reasons is that there is simply not the luxury of regular classroom time to spend on geography or U.S. history as stand alone subjects.

However, a sound geographical knowledge about one's own country is a necessary foundation for continued learning about that country in the upper grades. Unfortunately, if the standards for elementary schools do not *require* that it be taught, most students will not have the benefit of this basic knowledge until middle school.

Typically, in the first two quarters of first grade, students are introduced to the early explorer, Christopher Columbus, because of his birthday in October, and then the Pilgrims, because of Thanksgiving Day in November. Students have a basic idea of the discovery of our country--about how it all started. They are ready to expand that knowledge in the last two quarters of the first-grade year to include more detailed information about the growth of the U.S. and names of more than just the state in which they reside or attend school.

As a resource teacher at my school, I have the choice of teaching a range of curriculum subjects, as long as my main tool of instruction is technology, i.e., computer use, Internet research, document preparation, etc. As an elementary school educator who ardently focuses on literacy, all of my technology-based lessons include literature sections. I try to coordinate with the classroom teachers so that I am enriching subject areas being taught in the classroom. When

a first- grade teacher at my school asked me to design a U.S. history unit, I decided to design an enrichment unit for first-graders that centered on geography, specifically on naming the states. Since I am a proud American, with a rich and varied ancestry, and I have always been interested in my country's history, I knew I would enjoy teaching a unit such as this. Only when I was attempting to align my unit with the Hamilton County Department of Education's (HCDE) social studies standards, did I discover just how minimal the expectations are for first-grade students. I decided to teach this unit, administering a pre-test and post-test, and then analyze the results, as action research to determine if it was possible for students to exceed those expectations.

Review of Literature

According to Social Studies Standard 3.0.5 for elementary students in Hamilton County, the Hamilton County Department of Education's website says that students should "identify Tennessee and the United States on a map or globe" (Hamilton County Department of Education, 2002, ¶ 3.0.5).

> Why is a nation's geography important in the social studies curriculum?
>
> Social studies programs have as a major purpose the promotion of civic competence- which is the knowledge, skills, and attitudes required of students to be able to assume "the office of citizen" (as Thomas Jefferson called it) in our democratic republic. (National Council for the Social Studies, 1996, ¶ 5)

Basic civic responsibility or competence must stem from a solid understanding of the concepts. More advanced understanding of politics, economics, and cognition is a direct result of the prior knowledge acquired in the early years of one's education. When comparing student performance in geography assessments from 1994 and 2001, on the National Assessment of Education Progress (NAEP) in geography, the findings indicated that most students in the early grades could not name the state in which they live (Stoltman, 2002). Children's success in

history learning is related to the quality and quantity of history instruction provided in the school curriculum (Hoge, 1994).

The importance of history requires a significant increase in the time currently devoted to the subject in most schools (Risinger, 1993). Classroom schedules in public schools are stressed with extraneous issues, such as character education, while balancing the need for adequate time for teacher planning and collaboration. In my school, seven different enrichment classes are scheduled for students each week. The basic core subjects, i.e., math, reading, and language arts, are, and should be, top priority when planning classroom instruction. Yet, there should be a way to integrate a more thorough study of U.S. history while teaching the "basics" in the early grades.

Risinger (1993) recommends seven principles that are associated with effective teaching and learning in history: (a) chronological/analytical narrative, (b) interpretation of narrative, (c) inclusiveness, (d) pausing for depth,
(e) contingency and complexity, (f) exploring causality, and (g) active learning and critical inquiry. Any successful unit designed for teaching U.S. history should consider these recommendations.

Statement of the Hypothesis

By using a specifically designed enrichment (extra, more challenging activities) unit of study that includes Internet research, creative writing using Microsoft Word, student art work, and class discussion, and one that considers the recommendations for effective teaching and learning of U.S. history, are first- grade students *capable* of learning more than the HCDE standards expect? My research will examine results from a pre-test administered before students began the unit, my methods of teaching the unit, and results obtained from a post-test administered at the end of the unit.

Data Collection and Results

Participants

Twelve first-grade students at a private, Christian school in Chattanooga, Tennessee, were selected based upon their classroom teacher's expressed desire that they have an intensive enrichment study unit to correlate with classroom social studies work.

Instruments

The testing instrument consisted of a blank, black and white, outline map of the United States of America. An identical copy was used as both the pre-test and post-test. A copy of this document is located on the EnchantedLearning.com web site (2002).

Design

My research plan consisted of the following: (a) pre-test, (b) teach the unit, and (c) post-test. This unit also met the requirements of EDUC 591 at UTC.

Procedure

The 12, first-grade students selected for the study received a blank, black and white, outline map of the United States of America and a pencil at their computer workstation. There were no visual aids displayed on the wall, at the time. The directions were: (a) write your name in a corner of the paper, (b) write the names of any of the "things" that you recognize on the paper, and (c) do not be concerned if you do not recognize anything on the paper. When the students finished, I took the maps and filed them.

I then proceeded with my lesson plans for the unit I had designed, entitled One Nation Under God. According to my original unit plan, I had planned lessons for one 45-minute class and one 30-minute class each week with the first-grade students, making a total of 75 minutes of computer resource time per week that I would have to devote to teaching the unit.

Unfortunately, due to holidays, field trips, and other unforeseen schedule changes, I was able to average approximately 45 minutes per week during the 14-week unit.

At the end of the unit, I administered the post-test. I spaced students far enough apart so that there would be no sharing of information. As I did with the pre-test, I covered the wall maps so the students would have no visual aids. I provided a word bank by writing the names of the 13 states we had studied on the white board.

The time schedule for this case study is presented in Figure 1.

First grade teacher asked me to develop computer-based enrichment unit for U.S. Geography	Dec. 15, 2003
Administer pre-test	Jan. 9, 2004
Introduce One Nation Under God	
Week 2 - Delaware	Jan. 12, 2004
Week 3 - Pennsylvania	Jan. 20, 2004
Week 4 - New Jersey	Jan. 27, 2004
Week 5 - Georgia	Feb. 1, 2004
Analyzed pre-test data	Feb. 5, 2004
Week 6 - Connecticut	Feb. 9, 2004
Week 7 - Massachusetts	Feb. 17, 2004
Week 8 - Maryland	Feb. 23, 2004
Week 9 - South Carolina	March 1, 2004
Week 10 - New Hampshire	March 8, 2004
Week 11 - Virginia	March 19, 2003
Week 12 - New York	March 27, 2004
Week 13 - North Carolina and Rhode Island	March 28, 2004
Week 14 - Review and administer post-test	April 2, 2004
Analyze post-test data	April 2, 2004
Complete research paper	April 7, 2004
Submit to Dr. McAllister	April 7, 2004

Figure 1. Time schedule for case study--Developing an Effective U.S. History Unit for First-Grade Students.

Data Analysis

When I analyzed the students' work on the pre-test, I learned that seven of the students could not label the state in which they lived. Five students (41% of the population) could not identify *any* state. The other seven (59% of total population) students could label at least one state. Of those seven, only five could identify Tennessee. The most states that any student labeled were three--25% of the total population did this.

The data distribution of the correct number of states labeled was 0, 0, 0, 0, 0, 1, 1, 2, 2, 2, 3, and 3. The mean number of states labeled correctly was 1, the median number of states labeled correctly was 1, and the mode was 0. Figure 2 is a chart depicting the results of the pre-test.

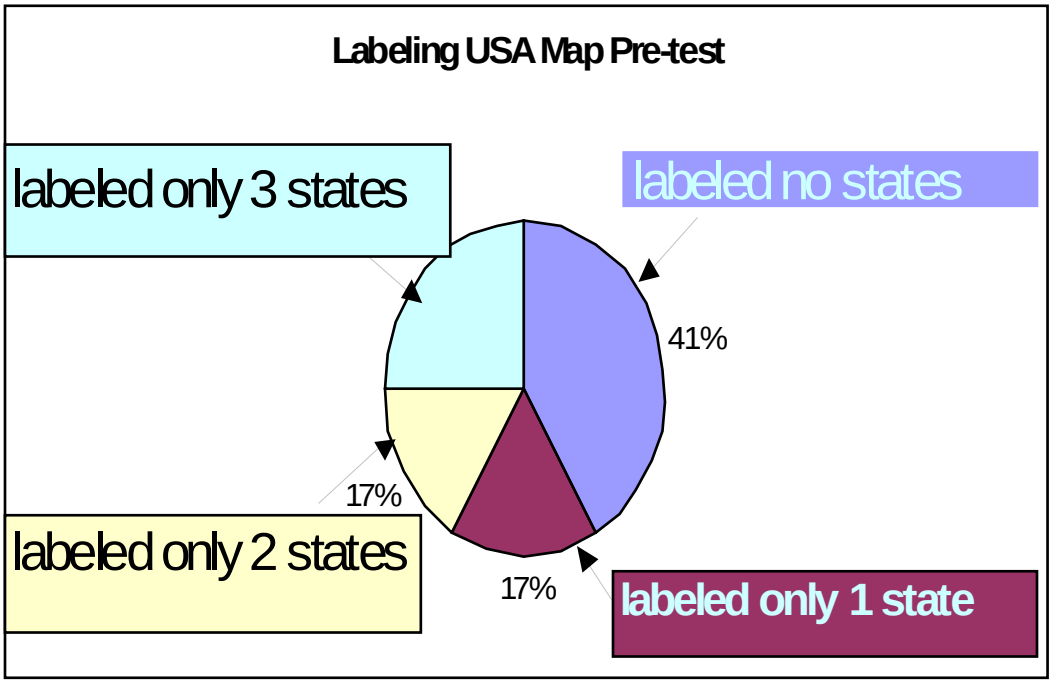

Figure 2. Labeling U.S. map--pre-test results.

I taught the unit, which spanned 14 weeks, as I had planned. Fortunately, absenteeism was low among this group of first-grade students during the teaching of One Nation Under God.

During the entire 14-week period, there were only two days in which one or more students were absent. Because of the low absenteeism rate, I felt confident that all the students had the opportunity to learn almost 100% of the information.

I administered the post-test with the same directions as I gave for the pre-test. Figure 3 is a chart depicting the results of the post-test.

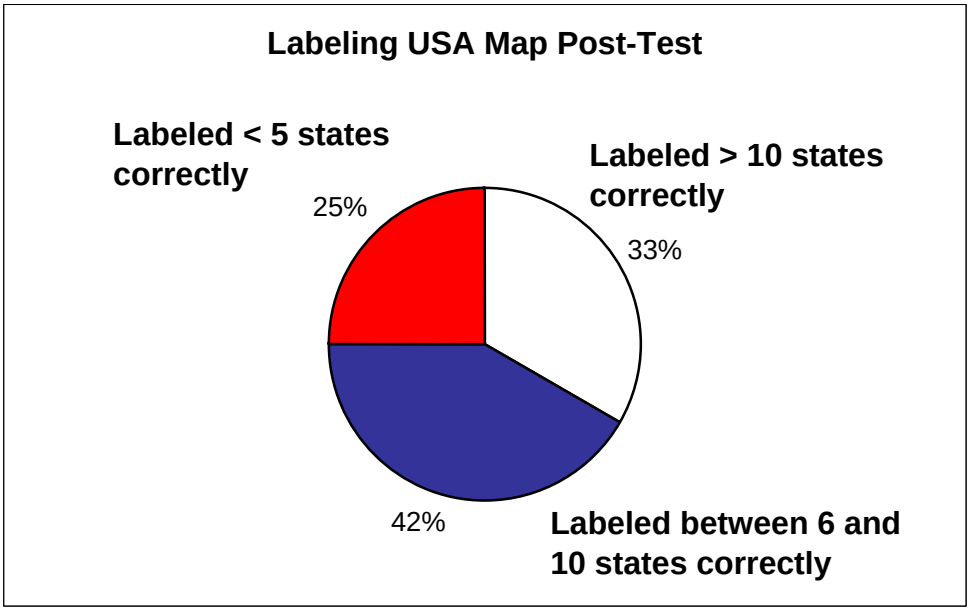

Figure 3. Labeling U.S. map--post-test results

I tried to concentrate my data analysis on measuring the accuracy of what the students were able to identify on the post-test map. I learned that 100% of the students were able to correctly identify at least one state. Twenty-five percent of the students were able to correctly identify at least one but no more than five of the states. Forty-two percent of the students correctly identified at least six but no more than eight of the states. One-third of the students correctly identified more than 10 of the states, with one student correctly labeling 15 states.

The data distribution of the correct number of states labeled after completing One Nation Under God was 1, 2, 3, 4, 5, 7, 7, 7, 8, 12, 12, and 15. The mean number of states labeled correctly was 7, the median number of states labeled correctly was 7, and the mode was 7.

Because it was possible to correctly identify zero states on the map, I considered this data as ratio variables. Therefore, the statistical measure of mean accurately indicated the measure of central tendency that would reflect the change in learning that occurred as a result of One Nation Under God. Out of a population of 12 students, the pre-test mean was 1. After participating in One Nation Under God, the mean for the same population changed to 7. Further, when considering all the deltas in the data points, the pre-test mean of 1 changed upward to a mean of 7 on the post-test, the pre-test median of 1 changed upward to a median of 7 in the post-test, and the pre-test mode of 0 changed upward to a post-test mode of 7.

Conclusions and Recommendations

One Nation Under God proved to be a valuable learning experience for the first-grade students in my case study. Based upon the results of my research, one can generalize that it is possible to develop an effective U.S. History unit for first-grade students, which results in a positive change in those students' learning of the content material and surpasses the HCDE Social Studies standards for first-grade students. My unit was successful because it used a combination of teaching methods, i.e., teacher-directed instruction, student inquiry, computer-generated graphics, and student-produced art.

Because of No Child Left Behind legislation, the current focus of the educational profession is on the high-stakes areas of reading, writing, and math. I have observed, as well as other colleagues with whom I talked, lesser importance placed on the teaching of historical knowledge of both the United States and the world. I have always maintained that reading,

writing, and math can be effectively intertwined with content-specific areas such as history and social studies.

However, to teach across multiple curriculums and subjects, a teacher must have background knowledge (but not necessarily be "certified to teach"), in all those subjects he or she wishes to combine. Professional development could possibly entail some outside reading or research into an historical time period, i.e., the Civil War or American Revolution. There are numerous workshops available about teaching methods using curriculum integration for many subject areas. At my school, I would feel comfortable designing and conducting such a workshop.

Since technology is one of the most efficient teaching tools, professional development must include training on a variety of computer applications suitable for subject integration. Students are very computer savvy today and educators must be able to teach in a way that maximizes student interest and aptitude for computer use. For example, when a student is using the Internet for research, reading is key to sifting out the usable information. Language arts knowledge of synonyms and antonyms is important for key-word searches in online databases. Using Microsoft Excel to produce charts and graphs forces students to think through the processes of computational math, then visually represent those computations in a computer-generated picture.

I do not think further "research" is needed to develop good teaching units that accomplish many goals and standards at one time. A teacher must be creative and use all the resource available to set the students up for success on the standardized tests. I believe grant money would be better used on obtaining those resources and then training the teachers to use them to their utmost value.

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Traditional Educational Methods: One School's Results as Reinforcement of Research on the Instructional Style with Respect to Underprivileged Students' Mathematics Performance

Davina K. Tompkins

Introduction and Review of Literature

A rising undercurrent of educational literature reflects a growing sentiment among educational leaders, parents, business leaders, and teachers that the past 30 years of progressive educational methods are not working, and, in many cases, perpetuating the underprivileged class in America (Fennell & Underwood, 1993; Goldberg, 1997; Hirsch, 1997; Nadler, 1998; Schiller, 1997). Tom Fennell, Nora Underwood, Richard Nadler, Mark Goldberg, and E. D. Hirsch agree in their respective research that the root of the problem can be traced to a child's readiness for the school environment, and such strategies as outcome-based education, active learning, discovery learning, constructivism, and the recently popular multiple intelligences approach exacerbate the gap that already exists between impoverished children and middle-class (or above) children when they reach kindergarten (Fennell & Underwood, 1993; Goldberg, 1997; Hirsch, 1997; Nadler, 1998; Schiller, 1997). Claims have been made that there are many places for students to hide inabilities inside these types of teaching (Nadler 1998). In Kansas City, MO, parents of minority and underprivileged children are demanding that school reform include a core curriculum and a strong degree of structure in the classroom (Nadler, 1998). Their argument is that there is a degree of knowledge that a child must achieve in order to break the bonds of poverty and move to the next socioeconomic class, but with the weak teacher roles associated with progressivism, the lack of resources at home are magnified at school (Eberstadt, 1999; Nadler, 1998; Smith, 1993; Sowell, 2002; Wooster, Lehrer, Schaefer, Gahr, Walter, Thomas, & Sale, 2001). As early as the late 1980's, Principal Joe Clark in Paterson, NJ, found success with his no-nonsense, tough-love approach to discipline in school Gullo, 1988). Mr. Clark's success included improvement in mathematics, language arts, and reading scores for his school. His words, "Discipline is the ultimate tenet of education," were a precursor to the more

recent essentialist movement (Friedrich & Bowen, 1988, p. 53). Concerns about what the educational system can do to prevent the loss of students from the lower ends of the socioeconomic spectrum, not only to the school system, but ultimately to society, have sparked much debate, even among constructivists. Henry Levin founded the Accelerated Schools Project in 1986 based on the premise that, instead of remediation or watered-down content, disadvantaged students should learn to "catch up" with their higher achieving counterparts with even more challenging content. Otherwise, disadvantaged students may only meet the low expectations set before them (Goldberg, 2001).

There have been other arguments that there exist large-scale financial incentives to perpetuate educational, racial differences because elite, private-school profits would suffer if public schools were producing as well or better than the private schools
(Eberstadt, 1999). The proposition made by all, and evidenced by research in pilot programs, is that underprivileged students perform better and close the socioeconomic gaps present if they experience school taught in a traditional, teacher-directed, whole-class instruction, highly-structured environment (Fennell & Underwood, 1993; Goldberg, 1997; Hirsch, 1997; Nadler, 1998; Sowell, 2002).

Questions Answered

Using historical data to include the state-mandated, end-of-course test scores, overall course grades, the required and highly-structured course map created and implemented by the county school system's secondary teachers, overall attendance, and a percentage representation of students enrolled in the course over the study time period that have qualified for the federal free and reduced lunch program, I tested the claim that end-of-course assessment scores and overall course grades for a group of underprivileged, Foundations of Mathematics II high school students can be improved using traditional teaching methods and a traditional classroom

management style. The primary question answered by the study is, "Does traditional, whole-class instruction coupled with a highly-structured classroom management style effectively improve test scores and course grades for the disadvantaged mathematics student?"

Method

Study Setting

The historical data was collected from the records of a rural high school. The school is comprised of a mixture of races representative of the community in which the school is situated. The high school is situated in a downtown region of a small town inside a sparsely populated area that is primarily rural. The high school includes junior high grades 7 an 8, however, they are made separate from the upper grades by means of a separate floor. There are 384 students enrolled in the six grades. The school is currently administered by a principal who enjoys cooperative parental support with respect to discipline. The school policy retains the right to use corporal punishment, when deemed necessary. The school schedule is currently block scheduling, so that a single course can be completed inside 1 semester.

Data Collection and Procedures

At the time of this study, four administrations of the Foundations of Mathematics II end-of-course test have been successfully completed. However, data from only the last three administrations are available from school records. Historical data regarding mandated end-of-course examination scores, students' qualification for free or reduced lunches, and attendance records was collected from the school's guidance office for review.

All historical data for prior Foundations of Mathematics II courses was tabulated to determine percentage pass/fail rates. Attendance records served to eliminate students with failing grades accompanied by low attendance rates from the statistical calculations due to the fact that those students lack of achievement cannot be considered a result of the instructional strategies.

The traditional instructional method classroom was defined to include a highly structured and procedural environment with an emphasis on direct instruction with frequent drill and practice, as well as adherence to the county-wide course map. The majority of the classroom instruction in the school curriculum is whole-class instruction with the teacher leading most discussions. The classrooms are expected to be quiet, reflective learning environments wherein teachers are able to administer individual instruction during individual practice portions of the lessons. Teachers assign classwork and homework freely and abundantly. Nearly all work produced by the students is graded in order to place a value on student performance. The grading scale is rigid, with little opportunity for extra credit so that students understand that success in the class is based solely on individual performance.

The school's attendance policy demands that students attend at least 170 out of 180 days of school, with no more than 5 missed school days per semester. In the event that students do not adhere to the attendance policy, a failing grade will be reported for the student, regardless of the student's performance in any given class. Every three student tardies also sum to equal one absence, so that students are encouraged to be prompt on a daily basis.

The county's secondary mathematics teachers have created a county-wide course mapping for each mathematics course taught therein. The course map includes a day-to-day, lesson-by-lesson, longitudinal plan to be followed by each teacher in the county. The map adheres directly and strictly to the adopted text for each course. The county administrators believe that strict course mapping eliminates gaps in student content knowledge in the event that students migrate from school to school inside the county. A copy of the county's course map for Foundations of Mathematics II is located in Appendix A.

Discipline in the school is rigid, with swift and appropriate punishment to fit the infraction. The teachers consistently enforce the rules of conduct and administer consequences as needed. Consequences include paddling, before and after school detention, suspension, and expulsion. Being involved in the small community, the principal involves herself directly in the disciplinary actions regarding students. Her decision to depart from the state recommendation for an in-school suspension policy indirectly involves the parents in student discipline, as it almost always requires them to make arrangements for students to serve detentions outside of regular school hours. The

subsequent parent involvement in student behavior expectations increases the school's student productivity in academic subjects.

Variables and Obstacles

Variables in the study are student motivation, the form of the mandated end-of-course exam, student behavior problems, and special needs students.

Obstacles were minimal. While no administration opposition was evident at this particular school, there is a possibility of some reluctance to publish even anonymous historical performance data elsewhere. However, the principal was eager to see her school deliver evidence for the most efficient and effective method for educating the disadvantaged student.

Statistical Analysis of Data and Reliability

The data collected for each class was tabulated and compared against socioeconomic data to determine the effectiveness of the teaching style in question. Socioeconomic status as determined from qualification for free or reduced lunches and attendance records were reviewed in the comparison for validity purposes. The tabulation of the research findings follows. Further analysis of student success or failure in subsequent mathematics courses would add to the

reliability of the study by means of charting long-term success rates. Reliability could also be achieved by repeating the study with subsequent Foundations of Mathematics II classes over an extended period of time.

Results

Appendix B reflects all data collected for the study on a percentage basis. Over the four test administrations that were reported, a total of 68 students were involved in the examination process. Of those, a total of 58 students achieved a passing score on the exam. Fifty-five students of the 68 students achieved a passing grade in the course, and 51 students achieved a passing grade for both the course and the examination. Over 29% (20 out of 68) of the total number of students enrolled qualified for free or reduced lunches. Of those 20 underprivileged students, 75% achieved a passing score on the exam, as well as maintained at least 95% overall attendance at school. Eighty percent of the underpriviledged students achieved a passing score in the course. Even more significant, 85% of underprivileged students, with at least 95% attendance, achieved a passing score in both the course and examination. When the data is reported on a per administration basis, the percentage of underprivileged students with a passing score in both the course and examination does not fall below 71% for administrations one through three. The fourth administration of the exam reflects an anomaly of a 50% failure rate. However, it must be noted that 50% of underprivileged students for that administration is equivalent to one student (see Appendix C).

Conclusions and Recommendations

When interpreting the data, I referred back to the Tennessee State High School End-Of-Course Test Policy and the No Child Left Behind Benchmarks. The State Test Policy does not require passage of the Foundations of Mathematics II examination for graduation, nor does it

detail a required percentage passing per school (www.state.tn). However, the NCLB benchmarks require 95% student participation on all state assessments and 100% student proficiency on all mathematics gateway tests by the year 2014. The NCLB benchmarks also include a required 60% graduation rate that excludes certificates of attendance (www.state.tn.us/education/mnclb). Given these constraints, and the fact that the high school's report card reflects a higher than 35 percentage for underprivileged students, but still an above average mathematical rating, it can be concluded that the study data reflects an above average passage rate for the included underprivileged students. At 85% passing both course and examination, there is room for improvement over the next 11 years of the phase-in of the No Child Left Behind Law. However, the school's instructional and disciplinary policies seem to be improving upon the odds for its underprivileged population. If 35.6% are underprivileged, the total school population is around 384, and 85% of the underprivileged are passing both the course and the examination, then only 21 students are not expected to pass the Foundations of Mathematics II course and examination. However, when the school's dropout cohort of 12.2% is multiplied against this year's senior class of 53 sudents, this year's estimated dropout number is 6 students. If we subtract those 6 students from our 21 not expected to pass the course or exam, then the number falls to 15 students. A figure of 15 students reflects just under 4% of the school's total population. In conclusion of the data analysis, the high school can boast a better than 96% success rate for its Foundations of Mathematics II students as a result of its traditional, disciplined classrooms.

Timeline

Data such as student qualification for free or reduced lunches, historical end-of-course test scores, course grades as recorded on grade report cards, and attendance rates was obtained from the administration at the beginning of the school year in which this research was reported. By

the middle of November of the same school year, the study results were completed in a summative report.

*Note: A special note of thanks to Mrs. Bobbie Coe Allison, Prinicpal Margie Allison, and all others at South Pittsburg High School and Marion County Department of Education for their generous allocation of time and resources in order to provide necessary information for the completion of this research.

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Appendix A: County-Wide Course Map For Foundations of Mathematics II

TEXT: *Pre-Algebra; An Integrated Transition to Algebra & Geometry*
PUBLISHER: Glencoe, McGraw-Hill

Summer 2000

SEMESTER ONE: CHAPTERS 1-7	DAYS
Chapter 1: Tools for Algebra and Geometry	***5***
Chapter 2: Exploring Integers	5
Chapter 3: Solving One-Step Equations and Inequalities	4
Chapter 4: Exploring Factors and Fractions	6
Chapter 5: Rationals: Patterns in Addition and Subtraction	5
Chapter 6: Rationals: Patterns in Multiplication and Division	7
Chapter 7: Solving Equations and Inequalities	8
Total Days	**40**

SEMESTER TWO: Chapters 8-14	
Chapter 8: Functions and Graphing	***6***
Chapter 9: Ratio, Proportion, and Percent	6
Chapter 10: More Statistics and Probability	3
Chapter 11: Applying Algebra to Geometry	5
Chapter 12: Measuring Area and Volume	5
Chapter 13: Applying Algebra to Right Triangles	4
Chapter 14: Polynomials	3
Total Days	**32**

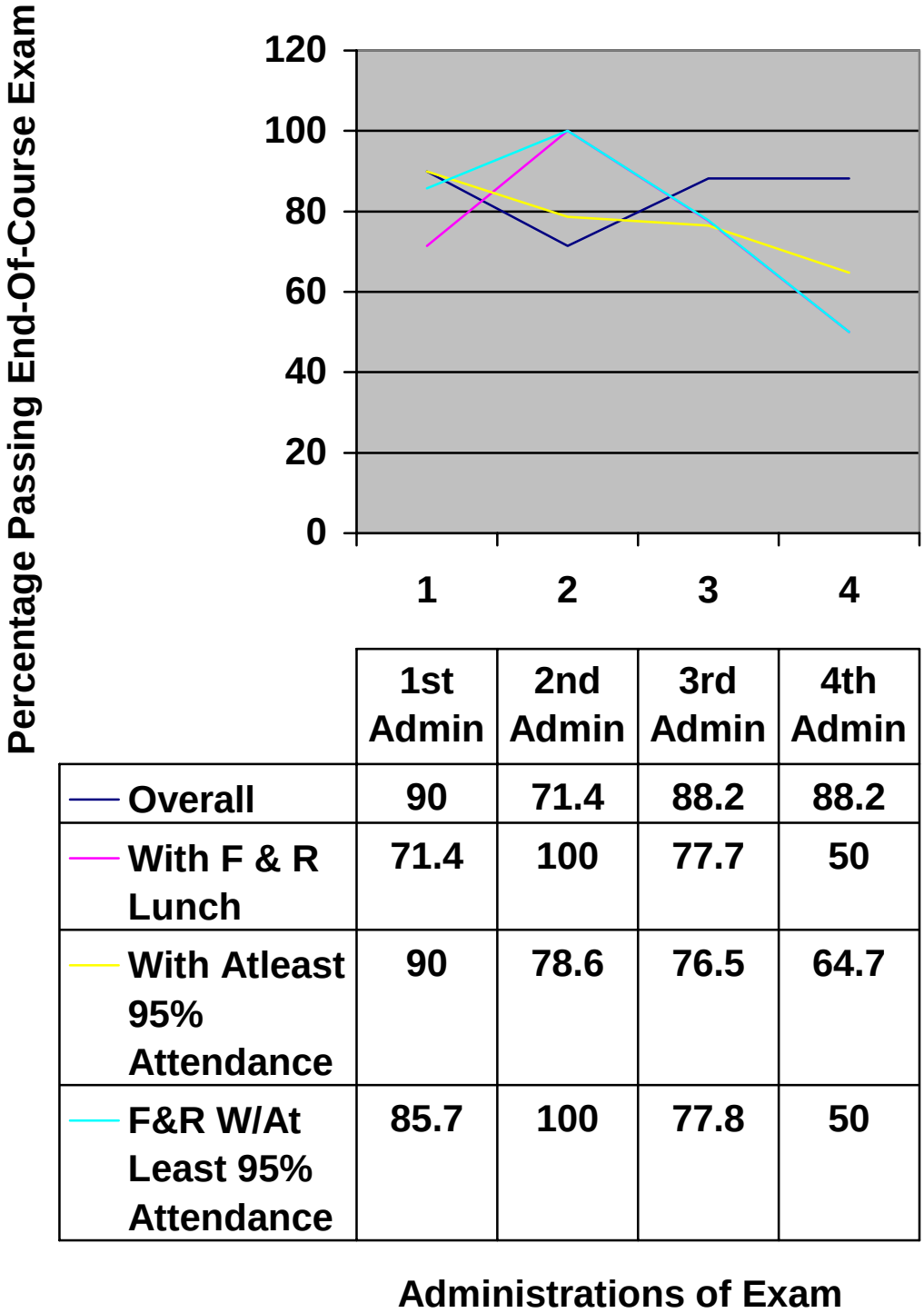
FOUNDATIONS II = 1 MATH CREDIT

Appendix B: Comparison of Test Administrations

	Admin. A	Admin. B	Admin. C	Admin. D
Total Students	20	14	17	17
Semester/Year	Spring 2002	Fall 2002	Spring 2003	Spring 2003
% F&R Lunch	35	14.285	52.94	11.76
% Pass Course	70	78.57	82.35	94.12
% Pass Exam	90	71.43	88.24	88.24
% Pass Both	65	71.43	82.35	82.35
% F&R/Pass C	71.42	100	77.78	100
% F&R/Pass E	71.42	100	77.78	50
% F&R Pass Both	71.42	100	77.78	50
% of Students with at least 95% attendance	90	78.57	82.35	94.12
% of F&R with at least 95% attendance	85.71	100	77.78	100

- F&R = Free and Reduced Lunches
- C = Course
- E = Exam

Appendix C



	1st Admin	2nd Admin	3rd Admin	4th Admin
Overall	90	71.4	88.2	88.2
With F & R Lunch	71.4	100	77.7	50
With Atleast 95% Attendance	90	78.6	76.5	64.7
F&R W/At Least 95% Attendance	85.7	100	77.8	50

Are Standardized Tests True Measures of Achievement?

A Case Study

Juanita Wade

EDUC 590

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project 04-044.

Project Outline

Are Standardized Tests True Measures of Achievement?

1) What will be assessed?
    a) Students' grades in the classroom will be compared to their individual and class scores on the Sharpen Up! standardized tests.
2) Who will be assessed?
    a) Three, seventh-grade geography classes at a middle school.
3) How will assessment occur?
    a) The grades for the 9 weeks in which I am a student teacher will be compared to the class and individual scores from the Sharpen Up! Tests, pre- and post-tests.
4) When will assessment occur?
    a) Assessment will occur immediately before my student teacher placement, the pre- tests, and during my student teacher placement, the classroom grades and post-test.
5) What instruments will be used?
    a) Classroom grades and class and individual scores from the Sharpen Up! Pre- and post-tests.

Introduction

Standardized tests have always had a black cloud surrounding them. Even as a student, I remember the week that we would be tested; we were told to get to bed early, have a good breakfast, and come to school prepared. They would even send home checklists to our parents suggesting ways to help us "pass" our achievement tests. So much emphasis was placed upon these tests and how hard they were, but nothing really ever came from those test results that I felt applied directly to me, other than the fact that I saw no real purpose in coloring in those small circles for half the day. As a teacher now, I have a different view on standardized testing.

As teachers, we are always motivated to help improve our students' academic achievement. At the present time, testing is the main focus in many of our schools and according to Deborah Meier, a leading education reformer, "testing only lowers standards by emphasizing breadth over depth, and makes schools accountable for the wrong things" (Paulson, 2002, ¶ 2). Schools need to be held accountable for what is learned. Students need to be able to demonstrate that they know how to apply their learning, but also to be able to apply it to problems that they were not taught and show how they learned it.

The No Child Left Behind Act of 2001 (NCLB), also known as the reauthorized Elementary and Secondary Education Act, now requires statewide reading and mathematics tests each year for children from third grade to eighth grade by the 2005-2006 school year. This legislation follows efforts in many states to use standardized testing to introduce higher levels of accountability in education. Due to this legislation, a great deal of pressure is being placed upon teachers to have all students testing at specific levels on standardized tests, regardless of their academic status, i.e. inclusion, or resource.

Principles and Indicators for Student Assessment Systems, developed by the National Forum on Assessment, shows the need that many educators have to restructure present assessment methods, with the concept of student learning being the made the fundamental focus of assessment reform. The National Forum on Assessment endorses seven principles presented by the *Principles* that provide a framework for a new assessment system. These principles, as presented by D. Monty Neill, the Associate Director of the National Center for Fair and Open Testing (FairTest), are:

1. The primary purpose of assessment is to improve student learning.
2. Assessment for other purposes supports student learning.
3. Assessment systems are fair to all students.
4. Professional collaboration and development support assessment.
5. The broad community participates in assessment development.
6. Communication about assessment is regular.
7. Assessment systems are regularly reviewed and improved.

Many of the misperceptions that Americans have about traditional standardized achievement tests stem from the misleading label of an achievement test. *Achievement* conveys the idea that these tests, as Webster's Dictionary puts it, measure "knowledge or proficiency in something that can be learned or taught." In other words, an *achievement* test would seem to be measuring what students have *learned* in school. But this is not the measurement function of traditional standardized achievement tests. Ever since such tests arrived on the scene in the early 1920s, their overriding function has been to permit comparisons among test-takers. Indeed, today's standardized achievement tests are patterned directly after the Army Alpha, a group-

administered intelligence test used in World War I to identify potential officers. But to make certain that standardized achievement tests provide accurate comparisons, the developers of these tests include many items that have nothing to do with what's supposed to be taught in school. Because many of their items measure what students bring to school, not what they learn there, traditional standardized achievement tests should have no role in evaluating our schools.

Is it possible to build standardized tests that accurately measure what's been taught in school? Absolutely. But those tests must be built with that specific role in mind. We need to evaluate a school based on how much students have learned in that school. But we'll never do so if, because of misunderstandings about the role of traditional standardized achievement tests, we continue to use the wrong tests when judging our schools.

Given these principles regarding regular assessment in the classroom and how an achievement test is created, how can standardized tests truly measure a student's achievement? In my research, I was unable to find any concrete studies that had been done to support standardized tests as accurate measures of achievement. I believe that the research I will be doing will assist others in making informed decisions on whether or not standardized tests are accurate in measuring student achievement. Therefore, the hypothesis I will be testing is that the use of standardized tests is not an accurate measure of a student's classroom performance.

Review of Literature

An important study to consider when dealing with standardized tests is a study done at Michigan State University in 1983. This study best exemplifies the seriousness of the variance that can occur between what's taught in our schools and what's tested through standardized

achievement tests. These researchers selected five nationally-standardized achievement tests in mathematics and studied their content for grades 4–6. Operating on the very reasonable assumption that what goes on instructionally in classrooms is often influenced by what's contained in the textbooks that children use, they also studied four widely used textbooks for grades 4-6. Utilizing rigorous review procedures, the researchers identified the items in the standardized achievement test that had not received meaningful instructional attention in the textbooks. They concluded that between 50 and 80 percent of what was measured on the tests was not suitably addressed in the textbooks. If the content of standardized tests is not satisfactorily addressed in widely used textbooks, isn't it likely that in a particular educational setting, topics will be covered on the test that aren't addressed instructionally in that setting?

As intense debate continues regarding whether or not standardized tests really are accurate indicators of children's abilities and whether students should be prevented from advancing to the next grade or graduating on the basis of a single score. During these debates, little attention has been paid to what is being sacrificed when schools are forced to focus on test results. Cutbacks in science and social studies have occurred in states that do not include those subjects on standardized tests. Students are being denied the chance to read real books because much of the reading content on standardized tests focuses on isolated language skills and an analysis of short fragments of text. Because of the focus being placed on preparing for these tests, there are fewer opportunities being provided to allow students to learn outside the classroom. These include field trips and mentoring programs. Some of the richest learning opportunities are being phased out. These changes within schools suggest that higher scores may actually be cause for concern instead of celebration. Rising test scores should cause parents to

ask, “What was taken away from my children’s education in order to make them better at taking standardized tests?” (Kohn 2001)

As we take away programs from students in schools, the schools are held more accountable for the success of their students. Many feel that more testing and accountability, based on those tests, will improve education, particularly in schools serving predominantly low-income and minority-group children. FairTest disagrees and in their article, *Will More Testing Improve Schools?, and s*tates the following reasons:

> We believe there is an important role for good assessment of student learning. The public deserves to know how well schools are doing, schools need to use information about student learning to improve teaching, and there should be intervention in schools which are unable to improve even when they have been provided the resources and tools to do so. None of this requires heavy reliance on results from state or commercial standardized tests. Focusing on those tests will not lead to high quality education for all children, but will instead turn schools into test-prep assembly lines that will leave many children behind. The emphasis on test results will undermine, not improve, the quality of education in schools now providing good education, and will not improve the quality of schools which most need help. It will diminish in particular the educational opportunities and outcomes for students of color and low-income students. (n.d.b, ¶ 3)

The public concept of what makes a good school has caused many changes to occur within the school systems in the US. They have established standards-based curricula, monitored test scores, required students to repeat a grade or a subject, and rewarded/punished teachers and principals when test scores rose/fell. These reforms have been condensed into a

model to ensure that urban, suburban, and rural schools produce graduates who are equipped with the knowledge and skills to secure high-paying jobs and help their employers compete in the global economy. Opinion polls find that parents and taxpayers are satisfied with this direction. However, is this model what is best for the student? There are several considerations to look at in this model. The standardized tests that elementary and secondary students take bear little or no relationship to future job performance. Curriculum will narrow to match whatever content and skills are tested. Instructional time will be increasingly allocated to test preparation. Political pressure on policy makers will lead them to lower cutoff scores in order to reduce the mounting numbers of students who will fail tests and have to repeat grades. As test scores rise over time (while teachers get better at aligning instruction with what is on tests), policy makers will change the tests and scores will decline. Ethnic and racial gaps in academic achievement will persist.

While reforms that have been passed have hoped to achieve a positive outcome, many have not. By truly looking at the assessment system that is being used in our schools and not relying solely upon standardized tests, there is great potential to our students. However, this can only be achieved through the right kind of reforms. Teachers need to have a collection of classroom-based, culturally-sensitive assessment practices and tools to use in helping each and every child learn to high standards. Educators collaboratively use assessment information to continuously improve schools. Important decisions about a student, such as readiness to graduate from high school, are based on the work done over the years by the student. Schools in networks hold each other accountable for student learning. And most importantly, public evidence of student achievement would consist primarily of samples from students' actual

schoolwork rather than just reports of results from one-shot examinations. To many teachers, this ideal classroom might become a reality if the right reforms were to be set into place.

Legislators hoped that the No Child Left Behind Act would be able to accomplish these goals, but it may instead intensify the problems already present in the schools that cause the children to be left behind. By following the stipulations set down by NCLB, the indication of student progress in most states will be reduced to reading and math test scores. Many schools will narrow instruction to cover only what is tested. Education will be damaged, especially in low-income and minority schools, as students are prepared to pass a test rather than learning a rich curriculum to prepare them for life in the 21st Century. The federal law should be transformed from one that uses punishments to control schools to one that supports teachers and students. It should move from one that relies primarily on standardized tests to one that encourages high-quality assessments. Elected representatives should listen to educators and parents to determine the real needs of schools. Congress should work with the states to ensure that all schools are adequately funded and that all children have adequate food, housing, medical care, and other basic human needs to enable their success in school.

Educators should definitely be held accountable for the educational achievement of our children. The teaching of our children is too important to be left unmonitored. However, evaluating educational quality by using the wrong assessment instruments is a betrayal of our good sense. Although educators need to produce valid evidence regarding their effectiveness, standardized achievement tests are the wrong tools for the task. So what are the best tools that should be used?

One possibility is the use of pre- and post-tests. If the skills being selected measure really important cognitive outcomes, which parents and policymakers determine to be significant, and can be addressed instructionally by competent teachers, then the use of a set of pre--test-to-post-test evidence showing substantial student growth in such skills can be truly credible. What teachers need are assessment instruments that measure worthwhile skills or significant bodies of knowledge. Then teachers need to show the world that they can instruct children so that those children make striking pre-instruction to post-instruction progress. The fundamental point is this: If educators accept the position that standardized achievement test scores should not be used to measure the quality of schooling, then they must provide other, credible evidence that can be used to ascertain the quality of schooling. Carefully-collected, impartial evidence regarding teachers' pre-test-to-post-test promotion of indisputably important skills or knowledge may fill the bill.

Data Collection and Results

Plan of Action

The population that I will be looking at is seventh-grade geography students in middle schools. My sample will be the students that I am assigned to in my student teaching for the 2004 spring semester. This will then make my sampling method an opportunity sample. I will be able to make no generalizations in my findings regarding race, socioeconomic status, or urban settings. This is due to the fact that the middle school students are mainly white, lower class, and come from a rural setting, and few parents are educated beyond the high school level. This study will be of most use to educators that are in small rural schools that meet the above-mentioned characteristics.

The “instruments” that will be used are Sharpen Up! test results taken December 2003 and February 2004 and anonymous 9-week grades. Sharpen Up! tests are standardized tests given by the state of Tennessee as precursors to the annual TCAP exams for elementary and middle school students. Due to the fact the exams are state issued, I will be unable to obtain a copy to be used as an example. The grades will be an average of the first week of school, which will be only 3 days, my 7 weeks of student teaching, and 1 week when the supervising teacher will have taken back the classroom at the end of my student teaching experience.

The control group will be randomly selected from one of the three geography classes. They will receive no specialized instruction based upon the results of the Sharpen Up! test taken in December. They will have the same assignments and exams as the other two classes.

This research will take approximately 10 weeks to complete. The following is a tentative schedule to be followed.

1. Prior to my student teaching experience, I will discuss with my cooperating teacher using the results of the Sharpen Up! test that the students will take in December.
2. During my first week of student teaching, those test scores will be analyzed to gauge what topics need to be focused on during my student teaching.
3. The next 5 weeks of student teaching will concentrate on the predetermined topics.
4. The class will take their second Sharpen Up! Test during the last week of my official time at the school.
5. Results from the last Sharpen Up! test will be available approximately at the end of March.

Analysis of Data

Before analyzing the data, it is important to first look at several conditions that the Sharpen Up! tests were taken. In the pre-test, the students were given this test the last few days before Christmas break and were not very attentive to the answers. Students admitted they just filled in many of the blanks just to get finished. In the post-test, all classes were required to administer the test by a certain date. No other specifications were given by the administration. As it turned out, most of the seventh-grade teachers decided to give their tests on the same day. Class 1 had taken one test, Class 2 had taken three tests, and Class 3 had taken five tests before they took the Sharpen Up! Test for geography. It is important to take these factors into consideration when considering the results of the tests.

Very important flaws to be considered when looking at these test results are the changes between the mastery, partial mastery, and non-mastery levels of skills. One would expect the levels of mastery to increase with each test and the levels of non-mastery to decrease. As shown by Figures 1 and 2 this was not the case. In the pre-test class reports for classes 1-3 (Figure 1), geographic perspectives were at almost 90% mastery for all three classes. In the post-test class reports for classes 1-3 (Figure 2), geographic perspectives measured 65%, 40%, and 55%, respectively.

In order to accurately compare achievement levels of the Sharpen Up! tests and the actual classroom grades, I assigned each level of mastery a specific point value and then created a point level for each letter grade used in the classroom (see Figure 3). I then took the mastery levels for each student on the pre- and post-tests and added their points together to determine their letter

grade for each test (see Figures 8-13). The individual name of each student has been removed to protect his or her anonymity.

The comparison of the results from the Sharpen Up! tests and the actual classroom grades, as seen in Figure 4, show a dramatic difference. According to the Sharpen Up! tests results, all three classes should have a large percentage of students with a grade of C. In all three classes, the number of classroom A's exceeded the number of A's on the Sharpen Up! tests. For B's, classes 1 and 2 exceeded the Sharpen Up! grades and class 3 was lower than the Sharpen Up! test. In class 1, D's were equal in the classroom and in the Sharpen Up! pre-test but higher in the post-test. In classes 2 and 3, the classroom had fewer D's than the Sharpen Up! tests. Finally, in classes 2 and 3 F's were much higher in the classroom than in the pre- and post-tests. In class 1, there was 1 F on the pre-test but none in the classroom. Overall, the Sharpen Up! tests were in no way indicative of the classroom results which leads us to see that, when looking at the actual achievement of a student as compared to standardized tests, the standardized test are not accurate indicators of achievement. Figures are presented in Appendix A.

Conclusions and Recommendations

Since the amount of emphasis being placed upon standardized tests is increasing, this study is applicable to all educators interested in the validity of measuring achievement using standardized tests. Within the professional field, many educators feel that standardized tests measure more of what is not taught in the classroom than what is. If standardized tests are to be true measures of achievement, there are a few suggestions to consider: (a) a national curriculum, or at least a statewide curriculum, that uses the same textbooks could be implemented, (b) standardized tests created to measure each individual state's curriculum, and (c) disposing of the

use of standardized tests and basing achievement strictly upon classroom performance. So much is still available to study in this area that the possibilities are endless. There are different viewpoints to take, different standardized tests to study, and different school systems' approaches to testing to consider. Technology could be used to assist states in customizing standardized tests to meet their individual curriculums. This topic has never-ending possibilities of future studies.

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Appendix A

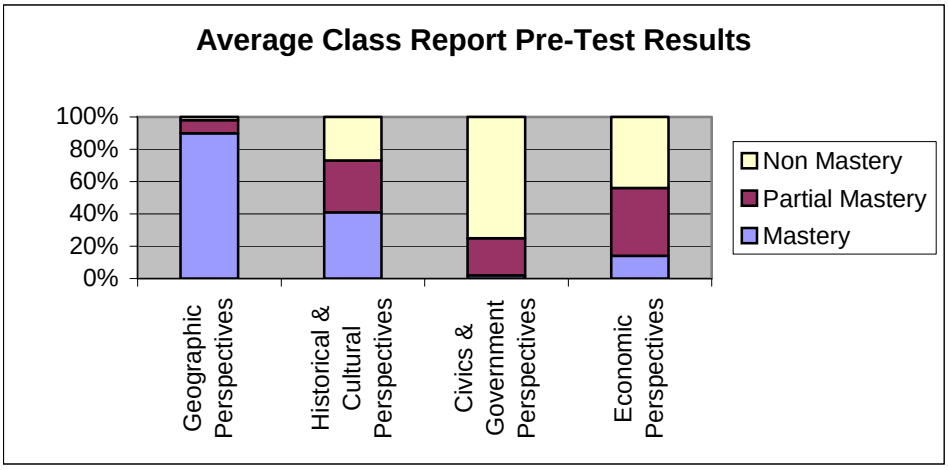

Figure 1. Pre-test class report for all three classes.

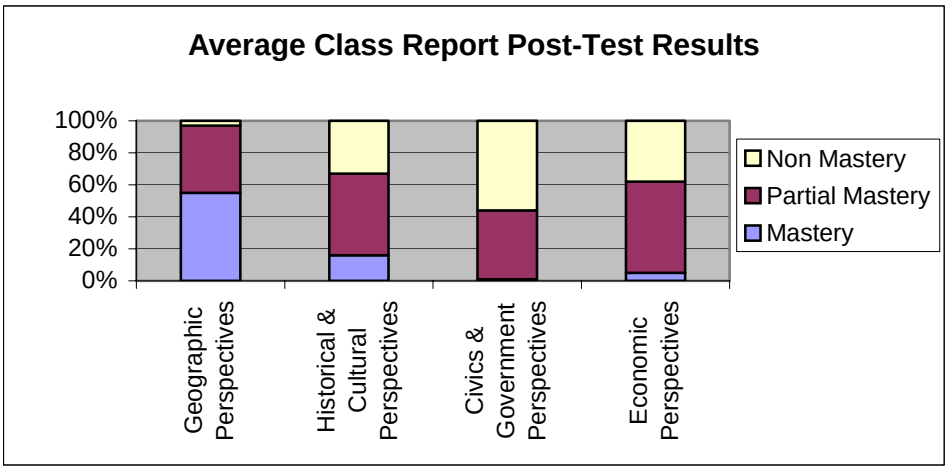

Figure 2. Post-test class report for all three classes.

Each mastered skill earned 3 points.
Each partial mastery of a skill earned 2 points.
Each non-mastery of a skill earned 1 point.

A	12 points
B	10-11 points
C	7-9 points
D	4-6 points
F	3 points

Figure 3. Points assigned to mastery level.

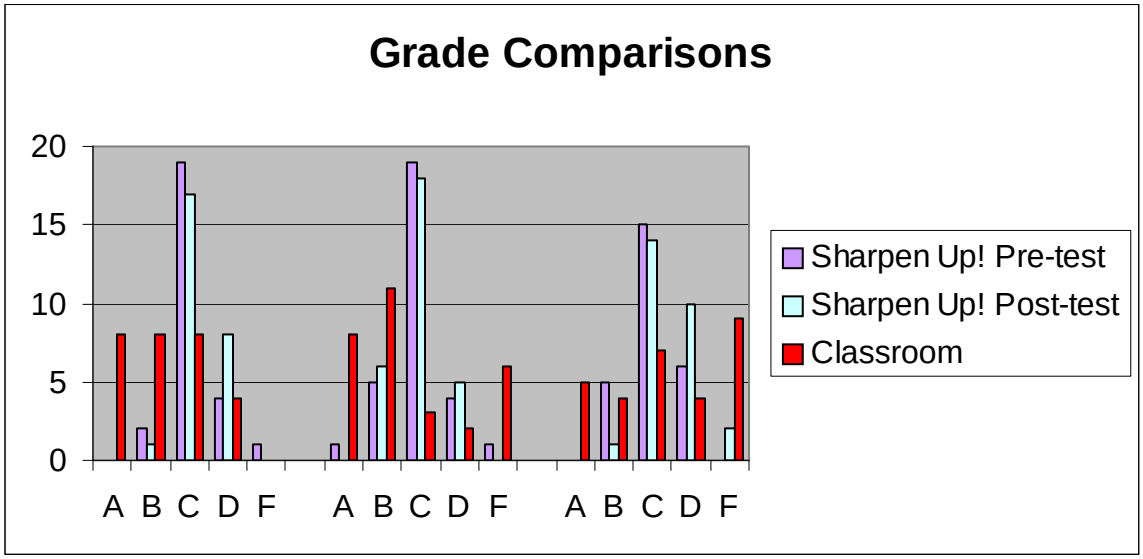

Figure 4. Grade comparisons for the three classes.