A cognitive approach to teaching research skills

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A COGNITIVE APPROACH TO
TEACHING RESEARCH
SKILLS

by
Christine M. Wilson

A Thesis
Submitted in partial fulfillment of the requirements
of the Master of Arts Degree in the Graduate
Division of Rowan University
April 27, 1998

Approved by
Professor

Date Approved
May 4, 1998

The purpose of this project was to develop a method for teaching research skills to sixth graders that would be appropriate for their cognitive abilities and prepare them for the research skills required by the seventh grade curriculum. Three classroom teachers and fifty-seven sixth grade students participated in this project. A short research project served as a pretest and inventory for knowledge of research skills. A unit of research skills and project preparation was then taught to the students in a series of eight lessons. Each skill modeled during the lessons provided concrete student learning. Examples of content materials and sample bibliography entries were provided for the students to use as guides. The students then completed a posttest assignment similar to the pretest assignment. A 12-skill checklist was completed for the pretest and posttest for each student. Each skill received a satisfactory or unsatisfactory rating. The scores were used to determine whether the unit of instruction was an effective means of teaching research and project preparation skills to participating students. It was determined that a systematic,
process unit based on appropriate cognitive abilities increased the students’ research skills and project assembly skills.
MINI-ABSTRACT


This project developed a method for teaching research skills to sixth graders. This approach was appropriate for the students’ cognitive abilities and served as a prerequisite for research skills required by the seventh grade curriculum. It was determined that a systematic, process unit based on appropriate cognitive abilities increased the students’ research skills and project assembly skills.
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Acknowledgements

So many people contributed their time and wisdom to this project – too many to formally recognize.

My family was an invaluable source of love and support. I would like to thank my husband Bob, whose encouragement was tireless throughout the year. He was always there for me with a kind word or a strong shoulder. My parents, Marietta and Joe, were always just a phone call away and never lost faith in my abilities to complete this project.

A special acknowledgement must be made to my aunt, Priscilla Cugino, who, for many years has been an inspiration through her master Librarianship and tutelage. Her love of the profession and the children she touches is immeasurable.

My gratitude to the faculty and staff of Aura Elementary School for their insights and cooperation throughout the year, especially my principal Donna Haye, and sixth grade teachers Frank Bohn, Linda Boltz and Larry Gurick. The fifty-seven sixth grade students were a both a pleasure and a challenge to work with.

A special thanks to Dr. Holly Willett who, through her expert teaching and eternal patience, guided me through this project with ease.
Chapter One

Introduction

The acquisition of proper research skills is a major concern among educators at all levels of schooling. Research skills are vital to academic achievement, from the earliest skills learned in elementary school through junior, senior and higher levels of educational institutions where those skills are applied and mastered. Locating information and determining relevancy, organizing and synthesizing information, drawing conclusions, making predictions and, finally, presenting a coherent project are skills that are essential to the educational progress of a student.

Purpose

A systematic approach to teaching critical thinking skills is fundamental in the acquisition of those skills in the elementary school. At the time of this study, there was no such systematic approach in place at Aura Elementary School. In the Library curriculum, there was only a list of those research skills to be taught during the sixth-grade year. The research skills taught during this year should be presented in a pattern or order that is easy for the children to follow, apply to content areas and later, in middle school and beyond, build on and strengthen.

Cooperation between the classroom teacher and the library media specialist is essential for providing meaningful application of those research skills taught, both in the library and in the classroom (Montgomery, 1992). Students need continuity
among the content areas. A cross-curricular approach will engage the students in learning the skills “when [the skills] are relevant or needed” (Burgess, 1987). A cross-curricular approach will also provide reinforcement in the constant and consistent instruction of research methods. Only with this approach will students understand that research skills are essential to all areas of their educational lives.

Cognitive Development

According to Jean Piaget’s theory of cognitive development, children acquire cognitive skills in stages (Slavin, 1991). Along this timeline, sixth graders are located at the end of the concrete operational stage or the beginning of the formal operational stage, since a child’s eleventh year is the approximate boundary between the two. With the progression of these stages comes the acquisition of certain cognitive skills. The concrete operational stage is characterized by logical reasoning, while the progression to the formal operational stage is a move toward abstract thinking.

Those cognitive skills acquired during these stages will determine which research skills are appropriately taught during this sixth grade year. The research must be carefully chosen not to require too much of the abstract reasoning since the children are just beginning to acquire that ability in this year, and may be at various stages in the acquisition of this ability.

Method

The skills chosen for instruction were among those from the current sixth grade curriculum and the seventh grade curriculum to which they are preparing to enter. This provided continuity between two years and, thus, two school buildings and programs.
Collaboration between the classroom teachers and the library media specialist was essential to this instructional plan. The classroom teachers of the sixth grades provided the necessary curriculum connection for application of taught research skills. The classroom teachers also helped to develop a plan of instruction of research skills. The skills will be taught in a systematic, meaningful way through the library media program and content area curricula. This will provide the children with maximum opportunities for successful application of learned research skills. The classroom teachers and the library media specialist will provide guidance through the process to ensure students’ understanding of the different stages of the research process (Kuhlthau, 1985).

**Participants**

Three classroom teachers and fifty-seven sixth-grade students participated in this project. The students participated in three heterogeneous groups of approximately 19 in each group.

**Evaluation**

A pretest was given to inventory the current knowledge of research and information skills of the sixth grade students, as well as to provide a benchmark on which to compare the students’ improvement after the experiment has been completed. Ongoing observations, discussions and checklists provided necessary reports on the effectiveness of teaching procedures used: age (cognitive ability) appropriateness, class size appropriateness, curriculum coordination, and teacher response. A final project served as a final evaluation tool for assessing students’ research skills, as well as the effectiveness of the program.
This instructional plan provided a place for the educators at Aura Elementary School to begin this year and possibly again next year. The educational process is constantly changing and this plan should, too. The students will grow, their needs will change, and the curriculum will be revised. This plan will be modified with the times.
Chapter Two

Review of Literature

Introduction

Teaching research and study skills to a group of sixth graders required some investigation into two major areas. In order to teach skills that are appropriate to the children’s cognitive development, Piaget’s stages of cognitive development were studied. As it was determined which skills are appropriate for sixth graders, the curriculum for sixth grade was examined in order to choose relevant skills. The curriculum from seventh grade was used to align the course of study between the two school buildings.

Child Development

In *Piaget’s theory of cognitive development* (1979), Barry J. Wadsworth states that “children will not learn [develop schemata] if they do not have prerequisite cognitive skills” (p. 135). A child’s “readiness to learn should be of concern at all levels of education” not just during a child’s early developmental years (Wadsworth, 1979, p. 135). Wadsworth also states that “it makes educational sense to use Piaget’s model … in determining when to teach what” (p. 135).

According to Jean Piaget’s theory of cognitive development, sixth grade children who are ages eleven or twelve are learning well within the concrete operational stage and the very beginning of the formal operational stage. This gives a
foundation for learning that can be built upon since the children are nearing the end of
the concrete operational stage, and it cannot be assumed that the children have
reached the formal operational stage.

Child development literature outlines Piaget’s cognitive stages of
development and those cognitive operations that are characteristic of each stage.
In *Educational psychology: Theory into practice*, Robert E. Slavin (1991) states that
the concrete operational stage (ages 7-11) is distinguished by reversibility,
conservation, inferred reality, transitivity and logical reasoning. Wadsworth (1979)
states that during this stage the child is “aware of and understands the relationship
between successive steps” and that the child is capable of making “cognitive and
logical decisions” (p. 96). Of the child’s limitations during this stage, Wadsworth
notes that concrete thought is limited to “solving tangible concrete problems of the
present” (p. 110). Concrete operational children cannot deal with “complex verbal
problems, hypothetical problems or those involving the future” and “operations are
not coordinated … the concrete operational child must deal with each problem in
isolation” (Wadsworth, p. 111).

The formal operational stage (age 12 and up) is characterized by abstract
reasoning, testing and solving hypothetical problems, and personal reflection.
Wadsworth adds that during this stage all cognitive structures mature.

**Curriculum**

According to the current version of the library curriculum of Delsea Regional
Middle School (grades seven and eight), locating information is a major part of the
course of study during the seventh grade year. Students are taught to locate
information in various places: the catalog (paper and computer), the Readers’ Guide and the vertical file. Reference books are another major component – dictionaries, thesauruses, encyclopedias, almanacs, and atlases -- as are periodicals, including newspapers. The seventh grade library skills program culminates in a small research paper, and at this point additional skills need to be taught. Among them are lessons on copying articles, taking notes, and forming outlines.

At the beginning of each school year, the incoming seventh graders are given a booklet: Research Booklet. This is a guide for the student with all the requirements and expectations of the middle school faculty. The booklet gives a brief outline of the steps in writing a research paper:

- Select subject
- Limit subject
- Prepare questions, if needed
- Prepare preliminary outline
- Read and take notes
- Prepare final outline
- Write rough draft
- Edit/revise rough draft
- Type final paper

An explanation of each step is provided, as well as examples for such things as taking notes, using note cards, outlining, parenthetical documentation and sample works cited entries. The skills outlined in this booklet helped to shape the sixth grade unit of instruction in becoming a prerequisite to the seventh grade curriculum.
**Skills Instruction**

The American Library Association states that a person is “information literate” if he or she is able to “recognize when information is needed and [has] the ability to locate, evaluate and effectively use the needed information” (Final Report, 1989, p. 1). In a school, the library is a place where students can find information. It is then the student’s responsibility to put that information to good use. Research skills instruction is vital to students application of information.

In an article in *Phi Delta Kappan*, Paula Kay Montgomery states that an integrated approach to teaching research skills is one that “combines classroom objectives, activities and assessments and that involves the classroom teacher, the library media specialist and the student” (1992, p. 530). The classroom teacher and librarian will share their expertise and knowledge with the student and all work toward achieving the common goal. Writing in *Catholic Library World*, Barbara J. Burgess attests that “...English teachers, librarians and specialists in reading and writing need to plan with and even team-teach with content-area teachers to achieve greater integration and greater authenticity” (1987, p. 117).

The teaching of research skills is effectively done in stages. In *School Library Media Quarterly*, Carol Kuhlthau suggests that “students need help in recognizing the various stages typical to the research process. They also need guidance in learning useful strategies to apply at the various stages in the process” (1985, p. 36).

Michael B. Eisenberg and Robert E. Berkowitz (1997) have developed an approach to information problem-solving called Big6 Skills™. The purpose of the
Big6™ approach is “to provide students with the understandings and skills they need to succeed” (Eisenberg and Berkowitz, 1997, p. 8).

The Big6™ model consists of six stages, which guide students through assignment completion:

1. Task Definition
2. Information Seeking Strategy
3. Location and Access
4. Use of Information
5. Synthesis
6. Evaluation

Within each of these stages are information activities that can guide the students (sometimes unknowingly) through a project or assignment.

Big6 Skills™ follows a hierarchy of students’ cognitive development, incorporating critical thinking skills as they are acquired. Individual skills can be acquired through this broad framework as they become appropriate. Big6™ teaches students to ask good questions, to independently organize and assess information, and teaches “creative, higher order thinking processes such as analysis, synthesis and evaluation” (Eisenberg and Berkowitz, 1997, p. 9).

The Big6 Skills™ approach can be applied to various situations, modifying components as necessary. This approach is an appropriate format to use as a model for a unit of instruction. The series of steps in this approach can provide a framework for instruction of research skills.
Chapter Three

Methodology

Background of Elk Township

Elk Township is a predominately rural community of twenty-two square miles, located in Gloucester County, New Jersey. There are 3,806 residents in this township, served by the local municipal government and the Elk Township Board of Education.

Elk Township students attend Aura Elementary school for grades pre-school through sixth. Students then proceed to the Delsea Regional School District for grades seven through twelve.

The district has been assessed at having between 20% - 40% low income students under the Comprehensive Plan for Educational Funding.

There is no post office, library, county government building or state government facility within the township. There is no supermarket, restaurant or gasoline station located within the township. The nearest community providing these services is Glassboro, New Jersey, located approximately four miles away.

Participants

The students in Aura School typically progress through the grades together, having only two or three sections of each grade each year. The students therefore become very accustomed to each other, as they are literally growing up together.
The sixth grade students in this study were found in three homerooms, each one with twenty children or fewer, and grouped heterogeneously. Of the 57 students, 32 were female (56%) and 25 were male (44%). All the students in the sixth grade were English-speaking. Of the fifty-seven students, 16 students (28%) were classified Special Education and attended the resource room. These students are distributed within the three homerooms. Seven percent (4) of the students were identified as Gifted and Talented and attend an after-school enrichment program, which meets every other week. Eleven children out of 57 (19%) were identified as “Low Income Students” and qualified for the free and reduced lunch program.

Rationale

A plan for teaching and testing research skills was devised to be as consistent from student to student as possible. The lessons were designed to remain within the concrete reasoning abilities of the majority of the sixth grade students, avoiding any areas of hypothetical problems and abstract reasoning. A single area of study was chosen so the students would be given very similar opportunities to complete the projects. The students were instructed to complete a research paper on a person of interest. It was predicted that the papers would follow a pattern and be similar in content. This would provide an impartial format for evaluation purposes.

Prior to assignment of the project, the three sixth grade teachers were consulted as to the requirements of the project and realistic expectations.
Pretest

The pretest assignment was used to establish a baseline of the skills and capabilities of the students. The scores from this project were used to determine what areas of instruction are necessary in compiling the unit lessons.

The students were given a typed list of requirements at the time of assignment. The list outlined the guidelines to be followed and what was expected of them (see Appendix B). The guidelines were: The paper should be one to two pages; three different sources were to be used, preferably of different types; the paper should be typed and double-spaced; and the paper should be proofread and without any spelling errors at the time of submission. The students were given two weeks to complete the project and the project was to be turned in during that library period two weeks later. The students were notified that late projects would not be eligible for the same grade as those turned in on time.

At this point, the students were left to browse through the biography section and select an appropriate topic for their projects. The students were required to submit their choices to the librarian before the end of class and were encouraged to select a book and check it out so they could begin working outside of class. It was also recommended that the students use any available time out of their regular schedule to return to the library and use the available resources, as the reference books and selected CD-ROM references do not circulate.

The next scheduled library period was provided for each class to use the available resources in the library and continue work on their projects.
Instruction

The unit of instruction was developed based on the general needs expressed by the students during the pretest and those requirements imposed by the Delsea Regional Middle School curriculum, including those outlined on page seven. The skills chosen for the sixth grade unit were those that were developmentally appropriate for eleven and twelve year old students and would become prerequisite skills for the projects assigned in the upcoming years.

The lessons were taught during the scheduled library periods in 20-minute sittings as well as additionally scheduled 40-minute periods.

The model presented to the students was that of a group project. Each student was going to complete the project that would be modeled during classes in the library. The students would later complete the posttest assignment using this group project as a template.

Instruction was given using an overhead projector and transparencies. This provided concrete modeling of any process that was required of the students, as recommended by Piagetian theorists, and the students mirrored the process using materials provided by the instructor.

The unit of instruction was broken into manageable lessons, each presenting a specific skill to the students which they would apply to their own projects in the future. Each lesson built upon the previous one, as the instructor guided the classes through the entire research paper writing process.

The impressionist painter Mary Cassatt was chosen for the subject of the group project. This topic was not chosen by any student for the pretest assignment.
and was of particular interest to the instructor. The profile of an artist would incorporate the life of the person as well as some investigation into the style of art, which would add another example in the variety of information appropriate to a research project.

Stage 1: Planning the Research Project

A great need for a lesson on planning developed during the pretest stage of the project. The students had difficulty beginning the project and had no vision for the result. This portion of the instruction was modeled after the first step of Big6™ – “Task Definition”: define the problem and identify the information requirements of the problem (Eisenberg and Berkowitz, 1997).

At the beginning of the lesson the students were given minimal information about the subject. The students were told only that Mary Cassatt was a woman, a painter and that she was no longer alive. Few of the students knew any more than that.

The students were given a worksheet that they would complete as the instructor did so on the overhead projector (see appendix B). The worksheet requested the students to ask five questions to be answered in the project. The instructor fielded questions from the class and recorded appropriate ones on the form. Assisted by the instructor, the students then formed those five questions into five main topics that would be the framework for the research project. The instructor guided the students toward an appropriate framework for this project. Although the students’ questions varied slightly among the classes, all three classes produced the same topics: (a) early life (of Mary Cassatt), (b) family life, (c) career, (d) style of...
art, and (e) accomplishments. This framework was replicated in the posttest, which was again biographical.

**Stage 2: Taking Notes**

This stage of the unit incorporates Big6™ step 2 – "Information Seeking Strategy", step 3 – "Location and Access", and step 4 – "Use of Information" (Eisenberg and Berkowitz, 1997). For future applications of this experiment, the steps will be broken into separate lessons and modeled. Given the time constraints this year, the librarian walked the students through some of the decision-making processes and evaluation of sources and led them right to the extraction of information from a source.

The seventh grade curriculum requires that the students take notes using index cards, and recommends a format for the students to follow. For this project, the students were given index cards for their notes. A few selected pages from a biography on Mary Cassatt were transferred to transparency so the students could follow the instructor through the process of finding information and transferring this information onto the index cards. Each pertinent fact was found in the text, then noted on a card. The card format was modeled through the overhead projector, so the students had no doubt as to the form or style. At this time, the lesson was given on bibliographic form. A list of example bibliography entries of various types was given to the students for reference and the bibliographic information from the title page was displayed on the screen (see Appendix B). The children then identified the appropriate bibliographic information and recorded it onto the back of the corresponding index card.
One lesson was dedicated to taking notes from a book and recording the appropriate bibliography entry. Another session was held to teach taking notes from an encyclopedia article as well as from an article found on a CD-ROM encyclopedia. Each set of notes was given the appropriate bibliography entry in proper form. During these lessons, a wide variety of notes was taken to cover all five of the topics proposed during the planning stage of the project.

*Stage 3: Organizing Information*

Big6™ identifies step 5 of its process as “Synthesis”: organize information from multiple sources and present the information (Eisenberg and Berkowitz, 1997). Upon evaluation of the pretests, the instructor decided that organizing the information and presenting the information needed to be taught separately.

The information collected was now organized into proper order, according to the topic outline constructed during the planning stage. The students put their index cards into piles according to topic. Each pile was inspected to determine whether there needed to be more information gathered. The instructor made sure that this did not happen. Each topic pile was then sorted into a logical order. Since all the students have the same notes as the instructor, this process was modeled by the instructor and recreated by the students.

*Stage 4: Writing the Draft*

This is the second point of the Big6™ step 5: “Present the Information” (Eisenberg and Berkowitz, 1997).

The rough draft was written by forming the notes into complete sentences and compiling the sentences into paragraphs. The students recommended possible
sentences, which were displayed on the overhead projector and copied by the students. A rough draft of the entire project was written in one session.

Stage 5: Proofreading and Revising

This stage most closely resembles the Big6™ step 6: “Evaluation” (Eisenberg and Berkowitz, 1997). The students evaluated their own rough drafts for grammatical and content errors.

Proofreading and revising was done after the rough draft had been written. The students suggested possible revisions and these were made on the transparency for the class to replicate on their own copies.

The bibliography page was also written at this time, using the overhead projector to display proper form of each entry. The differences in form between the various sources was emphasized and the students were reminded to refer to their format example pages for the appropriate model. Proper capitalization and punctuation was emphasized.

Stage 6: The Final Draft

The final draft was typed from the revised copy. Each child was responsible for using a word processor (or typewriter) and finishing the project on his own. Rereading and spell checking were emphasized.

Posttest

The posttest project was assigned after the six stages of the unit were completed. The students were given the same assignment as the pretest: to complete a biographical report. The same list of requirements was given to the students with
the same time allowance – two weeks. The posttest served as the instrument by
which success or failure of the experiment was determined.
Chapter Four

Results

Introduction

Fifty-seven sixth grade students participated in this project. Each student received the same assignments, lessons and instructions. Each student was given a pretest assignment, which was evaluated. After the unit of instruction was completed, each student was given the same instructions and a posttest assignment, which was also evaluated using the same criteria. The posttest scores were then compared to the pretest scores to determine whether the unit of instruction better enabled the students to successfully complete the research project.

Evaluation Method

A checklist was created to evaluate the research projects, with the pretest and posttest results for each student located on the same evaluation form. Each student was evaluated on twelve skills of form and style. Each skill evaluated received a satisfactory or unsatisfactory rating.

Return

Fifty-seven students were given the pretest assignment, the unit of instruction, and the posttest assignment. Of the 57 students, 37 (64.9%) returned both the pretest and the posttest. Only these 37 students are included in the results of this study.
Results

The results of the pretest and posttest assignments are reported in Table 1, which shows the number of students who received a satisfactory rating for each of the skills measured. Improvement occurred in all but two skills: page margins and number of sources required.

Pretest Results

Punctuality

On the pretest, 28 of the 37 students returned a project on the date required.

Project Format

A specific format was required for the pretest assignment. A heading, double-spacing, one-inch margins and a length of one to two pages were among the specifications outlined in the typed list given to the students.

Only six students could form an actual heading for their project. An appropriate heading would be at the top of the first page and include relevant information such as name, date, class and teacher’s name. The most common response among inappropriate headings was only the student’s name; sometimes this was written by hand and often the student’s name was written at the end of the report.

A majority of students, 64.8%, double-spaced their projects.

The instructor was sure to tell the students during the lessons that approximately one inch was the standard margin for word processors and that the students should only confirm that this was the case with their individual programs.
Table 1

Successful Completion of Skills

<table>
<thead>
<tr>
<th>Skill</th>
<th>C 1 (n = 9)</th>
<th>C 2 (n = 12)</th>
<th>C 3 (n = 16)</th>
<th>Totals (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Punctual</td>
<td>6</td>
<td>6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Heading</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Spacing (double)</td>
<td>8</td>
<td>9</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Margins (1 inch)</td>
<td>9</td>
<td>9</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Length (1-2 pages)</td>
<td>4</td>
<td>7</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Bibliography at end</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Proper bibliography</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Logical Flow</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Appropriate Language</td>
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<td>7</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Proper Grammar</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Proper Punctuation</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Sources (3)</td>
<td>6</td>
<td>5</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

Every student who returned a pretest did so with approximately one-inch margins around the text.

The instructor was sure to emphasize at the time of assignment that a requirement of one to two pages of text meant that more than one was required. Only 43.2% of the students could produce a project that fell within the one to two page parameter. Although there were a few projects that were longer than two pages, most of the remaining projects fell short of a full page in length.
Bibliography

The students were instructed to put a bibliography at the end of the project, and on a separate page. On the pretest, most of the students (72.9%) could put some form of references at the end of their projects. Most of the time the student placed the references on the next line or a few spaces after the report, but some did designate a separate page for the references.

During the two weeks of the pretest assignment the instructor received an abundance of questions about the content of a bibliography and of each entry. The consensus was that the students had no exposure to a bibliography and consequently no experience creating one. Not surprisingly, only two students (5.4%) constructed a bibliography of proper form during the pretest.

Content

The content of the project – logical flow of information and appropriate language – were to be substantial lessons during the unit of instruction. The instructor was encouraged after reading the results of the pretest assignment. A considerable number of students (81%) presented a project which flowed in a logical order. The obvious order was to follow the life of the subject; so this is perhaps not surprising.

Fewer students (62.1%) used appropriate language in the body of the paper. Many students wrote their report as if they were having a conversation with a friend – the language was very common and often contained slang.
Writing Skills

The use of proper grammar and punctuation results were not surprising after having compiled the results of the appropriate language skill. Proper grammar seems to coincide with appropriate language. Sixteen (43.2%) students could use the rules of grammar appropriately. Appropriate language was a skill with a relatively low success rate (62.1%) also.

The use of proper punctuation results were somewhat higher – 64.8% of the students could properly use rules of punctuation.

The instructor considered that there are some rules of grammar and punctuation that are not learned by the sixth grade year of education, such as the correct usage of the hyphen, dash and parentheses, the semicolon, and indirect objects. There was no credit lost for this type of error.

Sources

A surprising number of students could compile a project using three sources for information. Eighty-one percent of the students showed evidence of using three different sources of information for the project.

Posttest Results and Comparison

Both pretests and posttests were accepted for three weeks following the due dates. In the three weeks following the due date of the posttest, three additional projects were submitted to the instructor. The instructor made the decision to accept any remaining projects and evaluate those but not include those scores in the results of the experiment. The strict time constraint for completion of this experiment did not permit unlimited time for submission of posttests.
Punctuality

On the pretest, 75.6% of the 37 students returned a project on the date required, while 91.8% of the 37 students returned the posttest assignment in a timely manner.

Project Format

The same specific format was required for both the pretest and the posttest assignments. Heading, double-spacing, one-inch margins and a length of one to two pages were all evaluated in the posttest assignment, as they were in the pretest. Three of these four skills showed improvement in the posttest assignment (see Figure 1).

Figure 1. Number of students who successfully included a proper heading, spacing, margins and length of the pretest and the posttest assignments.

The greatest increase is shown in the presence of a proper heading, with a 67.5% increase in the posttest over the pretest. Spacing and length also increased – 27% and 24.3% over the pretest respectively. The one-inch margin requirement fell by only one student, from 100% on the pretest to 97.2% on the posttest.
Bibliography

There was a great increase in the presence and quality of the bibliography from the pretest assignment to the posttest assignment. The results suggest that when provided with a model of a proper bibliography the students had success in developing an acceptable bibliography page for their projects. In the pretest, most of the students (72.9%) could place their references at the end of the project, but only two students could present a semblance of proper form. In the posttest, a greater number of students (83.7%) could place their references at the end of the project, and 51.3% of the students could follow the proper bibliography format (see Figure 2).

![Figure 2](chart.png)

Figure 2. Number of students who successfully placed a bibliography at the end of the assignment and those who used proper bibliography form in the pretest and posttest assignments.

Content

Logical flow of a research paper was modeled during the unit of study, as was the appropriate language used in writing such a paper. Posttest results showed an increase in quality of both these areas. Logical flow rose from 81% in the pretest to
97.2% in the posttest results, and appropriate language rose from 62.1% to 94.5% respectively (see Figure 3).

![Bar chart showing logical flow and appropriate language comparison between pretest and posttest.](image)

**Figure 3.** Number of students with project contents containing a logical flow of ideas and appropriate language on the pretest and posttest assignments.

*Writing Skills*

Proper grammar and punctuation were evaluated in both the pretest and posttest assignments. On the pretest results, only 43.2% of the students showed proper grammar skills and 64.8% of the students showed proper punctuation skills. The numbers did rise on the posttest, but only by two students in each case. Grammar and punctuation skills are acquired over the years of a student’s education. The statistics show that the study skills unit did little to improve those skills, although a lesson was devoted to these areas.

*Sources*

The students were required to include three sources of information in their projects, preferably three of different nature. Eighty-one percent of the students could
locate and use three different sources of information for the pretest. Only 70.2% of the students could do so for the posttest.

Summary

There was an overall increase in scores from the pretest to the posttest, with only two skills showing a decline (one-inch margins and three sources of information). The greatest growth was made in three areas: the presence of a proper heading increased 67.5%; the proper form of the bibliography increased 45.9% and the use of appropriate language increased 32.4%.
Summary

The purpose of this project was to devise a systematic plan for instruction of research skills to sixth graders that they would be able to learn and apply in the sixth grade year and that would prepare them for future middle school projects. The unit of instruction was one that the students were cognitively able to absorb. The skills taught were a combination of those in the present sixth grade curriculum and those found in the current seventh grade curriculum at Delsea Middle School.

Traditionally, the teachers at Aura School each place their own requirements on students’ research projects. Some teachers have stricter requirements. Often, the English unit dealing with research skills is pushed to the end of the year and dealt with if time permits.

A systematic plan to teaching research skills will provide continuity throughout the sixth grade year. The unit will be formally taught through the library curriculum. Ultimately, the projects will be required in the students’ respective content areas, which will provide meaningful applications for the research skills learned.

The experiment involved 57 sixth grade students at Aura Elementary School in Elk Township, New Jersey. All 57 students were assigned a pretest project,
received a unit of instruction on research skills and project presentation, and were assigned a posttest project. Both the pretest and the posttest were assessed using the same criteria – a satisfactory or unsatisfactory was given to each of twelve skills being measured. The scores were then compiled and compared to determine what impact the unit of study had on the research skills of the students.

Conclusions

The goal of this experiment was to develop an instructional plan that would improve the research skills of the sixth graders and that would better prepare the students for their upcoming middle school experience. The instructor believes that this goal was met.

The students who submitted both a pretest and a posttest (37) showed an overall improvement in research and project preparation skills. Of the 37 students, 35 received a higher posttest score than pretest score. One student’s score remained the same. This was an exceptional student who received a perfect evaluation on both the pretest and the posttest. This student’s prior experience in constructing a bibliography entry enabled her to receive the only perfect score on the pretest, which left her no room for improvement. One student’s score declined by two points. This student showed improvement in the presence of a proper heading which raised her score by one point, but failed to include a bibliography, which lowered her score by three points. Most students are now better able to collect relevant information, present this information in a logical and appropriate form, apply proper grammar and punctuation skills to their projects and present the project in an acceptable form given proper page setup and bibliographical information.
The unit of instruction successfully provided a model for the students to understand and apply to a similar assignment.

The skills chosen for the instruction were concrete, easily modeled by the instructor and easily understood by the students.

There was a logical process presented to the students that they could replicate in future research projects in seventh grade and beyond. The small project provided a secure foundation for the students to build upon. The skills acquired are prerequisites for middle school projects, which will provide a smoother transition from sixth to seventh grade.

**Recommendations**

This unit of instruction has great potential for preparing students for the middle school projects in their futures. Certain modifications should be made in the next year to make the unit even more effective: (a) The unit should be taught over a longer period of time, possibly two months or more, with multiple lessons devoted to each skill taught. (b) The unit should be taught earlier in the year. This would allow more opportunities in the sixth grade year for the students to practice using the skills and would also allow the teachers more time to complement each other in cultivating the skills in the students. (c) The teachers should, within their own grade level, strategically schedule research assignments that would provide meaningful applications for the skills learned earlier in the year.

The theory behind this unit should trickle down through the grades. Once a plan is made for instruction of sixth graders next year, a fifth grade unit should be devised. If, each year, another grade level is instructed on information and research
skills, the abilities of the students will increase accordingly. This will provide continuity among the grade levels as the skills taught each year build upon the previous one. As the needs of the students change and the middle school curriculum is revised, so should this plan for instruction.
References


Appendix A

Letters
December 11, 1997

Members of the Board,

I am currently working on my final obligation of my Masters Program at Rowan University – my Thesis Project.

My project is to determine which research and study skills are appropriately taught to the sixth graders at Aura School. I will develop a curriculum that incorporates those age-appropriate skills and is coordinated with the curriculum that is used in the Delsea Middle School. I will use the months of January, February and March 1998 to implement this curriculum while using assignments to measure the success of the plan.

This plan will improve the sixth grade curriculum and better prepare the students for their middle school experience. I am requesting permission from the Elk Township Board of Education to conduct my project during this 1997-1998 school year.

Thank you for your consideration.

Respectfully,

Christine Wilson
Aura School Librarian
January __, 1998

Dear Parent/Guardian,

I am currently completing my master's degree in School and Public Librarianship at Rowan University. I will be conducting a research project under the supervision of Dr. Holly Willett as part of my master's thesis concerning teaching research skills to the sixth grade students at Aura School. I am requesting permission for your child to participate in this research. The goal of this study is to develop an effective plan for the teaching of research skills during the sixth grade year.

Teaching research skills during the sixth grade year is currently a part of the curriculum both in the classroom and in the library. I will be conducting the project during the natural course of the spring. The students will be completing two short research projects, one at the beginning and one at the end of the unit of study. Between the two projects, I will be giving the research skills instruction during the students' scheduled library periods each week.

The growth of the students' skills will be reported in my study in terms of group results; individual students’ results will not be reported.

Your decision whether or not to allow your child to participate in this study will have absolutely no effect on your child's standing in his/her class. At the conclusion of the study a summary of the group results will be made available to all interested parents. If you have any questions or concerns please contact me at 881-4551 or you may contact Dr. Holly Willett at (609) 256-4759. Thank you.

Sincerely,

Christine Wilson
Aura School Librarian

Please indicate whether or not you wish to have your child participate in this study by checking the appropriate statement below and returning this letter to your child’s teacher by Friday, January 30.

___ I grant permission for my child ____________________________ to participate in this study.

___ I do not grant permission for my child ____________________________ to participate in this study.

(Parent/Guardian Signature)  (date)
Sixth Grade Research Project

The topic of my project is: _____________________

Project Requirements:
3 different sources of information must be used.
The body of the research project will be 1-2 pages.
A bibliography of the sources will be placed at the end of the research project.
The project will be proofread for any spelling or grammar errors and those mistakes will be fixed.
The project will be typed, spell-checked again and will not have any errors.

The final project is due: ________________
Planning My Report

My report will be about ____________________________

Here are five questions I want to answer in my report.

1. ______________________________________________
2. ______________________________________________
3. ______________________________________________
4. ______________________________________________
5. ______________________________________________

Now make your questions into main topics for your outline.

Write your main topics here.

Write them in an order that makes sense.

I. ______________________________________________
II. ______________________________________________
III. ______________________________________________
IV. ______________________________________________
V. ______________________________________________
Sample Bibliography Entries

One Author


Two or Three Authors


Four or More Authors


Encyclopedia Article


Magazine Article


Newspaper Article


Computer Software


TIPS

Always arrange the entries in alphabetical order according to the author’s (or editor’s) last name. Write the name in reverse order (last name first). For entries with two or more authors, reverse only the first author’s name.

If you are not given author (editor) information, alphabetize the entry by title, disregarding the words *a, an,* and *the* at the beginning of the title.

If an entry runs more than one line, indent all other lines in that entry 5 spaces.
Title

Always indent a new paragraph 5 spaces from the margin. Blah blah blah Blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah blah.

Some rules to follow:

Use the same heading that appears at the top of this page. Insert your own information.

The report should be typed in font size 12.

The report should be double spaced.

There should be one inch margins around the page – mostly the computer will do that for you, you won’t need to check it.

Don’t forget to spell check, and don’t ignore everything, check for the correct spelling and replace!

The bibliography goes on its own page and it is the last page.
## Project Evaluation

**Student**

**Homeroom Teacher**

### PRETEST

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### POSTTEST

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