Using a Computer-Based Tutorial to Teach the Dewey Decimal System

Melissa V. Keefe
Valdosta State University
GA, United States
melissa.keefe@docoschools.org

Abstract: The purpose of this research project was to determine if *"Do We" Really Know Dewey?,* a web-based tutorial, was effective for teaching students the Dewey decimal classification system. This qualitative study included observations, pre- and post-tests, interviews, and post-intervention surveys. Two classes of fifth-grade students used the tutorial in one forty-minute session. Immediately after using the tutorial, students completed worksheets which required them to match 14 book titles with the correct Dewey category. Two days later, students conducted two timed book searches in the media center. The research showed that most of the students liked using the tutorial and that most learned some basic facts about the Dewey classification system. However, the tutorial had little or no effect on most students' ability to conduct book searches. While a few students were able to locate their books in less than one minute, most could not. The results of this study were presented to the learning community through a PowerPoint presentation and a display in the media center.

Background and Purpose of the Study

As an elementary school media specialist I see a constant flow of students in and out of our media center. We circulate about 265 books a day, thanks to the priority placed on the school's Accelerated Reader (AR) program. Students receive two reading grades each marking period based on their comprehension average and the number of Accelerated Reader points they have earned. While the program promotes reading and the use of the Accelerated Reader collection, it does not allow students the opportunity to explore the media center's non-Accelerated Reader books. The result is that students can graduate to middle school without any knowledge of how books are arranged in a library. This concerned me because the Accelerated Reader program becomes less important as students progress, while library and research skills become more important.

Librarians and media specialists have key roles in promoting students' information literacy which has been defined as "the ability to find and use information" (American Association of School Librarians and Association for Educational Communications and Technology, 1998). Information literacy skills are prerequisite for successful academic and professional careers. They also give people the ability to find information needed for personal enrichment and enjoyment throughout their lives. As a librarian and then a media specialist, I have always been committed to library instruction and wanted to provide our students with basic information literacy skills.

I decided to teach the Dewey decimal classification system because 95% of our country's public and school libraries use it to organize their collections (Online Computer Library Center, 2004). I also wanted to teach the system because Melvil Dewey, the librarian who created the system, also believed that library instruction was an important part of any librarian's job (Thomas, 2004). With a basic knowledge of the Dewey system our students could locate information in most libraries. They would also be able to find library materials needed to comply with the new Georgia Performance Standards requiring fifth-grade students to read a variety of genres and subjects "to inform their oral and written discussions of topics" (Georgia Department of Education, 1997-2005, p.1). After deciding to teach the Dewey system, I had to decide how to teach it to elementary school students.

Dewey instruction is most effective if elementary students walk through the stacks to see how books are shelved (Moore & St. George, 1991) and if they are given the opportunity to practice finding books (LeBlanc, 2001). Web-based library instruction appeals to students' natural inclinations to use computers (Gibson & Mazur, 2001) and it offers students anytime access for further practice (Cudiner & Harmon, 2001; Michel, 2001). Dewald (1999) described the characteristics of effective web-based library instruction: it should include active and collaborative learning; graphics; clearly-stated learning objectives; and easy-to-follow directional signs. It should teach concepts, not just mechanics, and it should not be used as a substitute for librarian interaction with students.

My Research Question

"*Do We" Really Know Dewey?,* an award-winning web-based Dewey tutorial created by a media specialist and fifth and sixth-grade students, met all of Dewald's criteria. I decided to present the tutorial in our computer lab and combine this instruction with orientation and book searches in the media center. In my action research project, I sought to answer this question:

- Is the online Dewey decimal classification system tutorial "*Do We" Really Know Dewey?* effective for teaching the Dewey classification system in my school?

Research Methods
Setting and Participants

My action research project was conducted at an elementary school in southern Georgia. The school has 740 students in kindergarten through fifth grade with the following ethnic backgrounds: 57% African American; 42% White; 1% Hispanic, Asian, Native American and multiracial. Forty-seven percent of the students qualify for reduced or free lunches. Students' ability levels range from low to high and they are randomly assigned to classes. All classes attend weekly computer lab sessions and the media center's flexible schedule accommodates classes and students during school hours.

The participants in my study involved the teachers and 41 students in two fifth-grade classes. After obtaining access from my principal and superintendent, I described my project to our five fifth-grade teachers and three volunteered to participate. I chose the first two and obtained consent forms from them. I distributed parental consent and student assent forms. Two students in each class chose not to participate.

Instructional Intervention

My intervention took place over the course of two weeks. The web-based tutorial "*Do We" Really Know Dewey?* provided the instructional material for my project. The tutorial was designed to teach basic facts about Melvil Dewey, his classification system and how to use it to find books in a library. Additional facts covered in the instruction included definitions of fiction and nonfiction as well as the difference between the natural and applied sciences. The self-paced tutorial was divided into five sections, followed by a quiz. Each class completed the tutorial in forty minutes and reviewed the quiz which they later completed in print as the Dewey worksheet.

Data Collection Strategies

A variety of data-gathering instruments were used to collect information about the instructional effect of the "*Do We" Really Know Dewey?* tutorial. I was interested in students' reactions to it as well as how much they learned from it. Multiple sources of data were collected about students' Dewey knowledge acquisition and their reactions to the tutorial to help insure validity. Pre- and posttests were used to measure differences between students' knowledge about Dewey and his classification system before and after their exposure to the tutorial. After using the tutorial, students completed worksheets and book searches which tested their knowledge of the ten Dewey categories and the types of books to be found in each. The worksheets were graded and the book searches were assessed and timed.

To gather data about the nature of students' interactions with the tutorial, I made observations and notes as a participant observer while leading the instruction. To counter my own possible bias as the researcher, I asked each teacher to participate as a passive observer during the lab sessions. After each lab session I interviewed the teachers to record their impressions of the students' interactions with the tutorial. Teachers were asked about their perceptions of their students' level of engagement and difficulties with the tutorial.

Every student completed a post-intervention student attitude survey. The survey asked students whether they found the tutorial interesting, boring, easy or difficult and if they thought they learned from it. I also randomly selected 6 students from each class and interviewed them. The interviews asked students what they liked and disliked about the tutorial, whether they thought it taught them anything, and the degree to which they thought it helped them with their book searches.

Procedures

I administered the pretest to all forty-one students during the first week of my project. At the beginning of the second week, I took each class to their scheduled forty-minute computer lab session. Thirty-nine students were present for their lab sessions. I began by explaining that the "*Do We" Really Know Dewey?* tutorial had been created by a media specialist and several fifth and sixth-grade students for the purpose of teaching other students about the Dewey classification system. As students followed on their computers, I used a whiteboard to show them how to access the internet and find the site which had been saved as a "Favorite." I worked through the tutorial, reading it aloud, as the students followed on their computers. Their classroom teachers observed and assisted students who needed help. All thirty-nine students completed the tutorial by the end of their lab session. After their lab session, I brought the students to their classrooms and asked them to complete a Dewey worksheet (Appendix A). I explained that the worksheet would not be graded and that it would enable me to see how much they could remember about the Dewey categories. The students completed the Dewey worksheets in 5 to 15 minutes.

Two days after completing the worksheet, I brought each class to the media center for a forty-minute session. A total of 37 student participated in these sessions. I began with a tour of the non-Accelerated Reader Dewey part of the collection; a review of the left-to-right, top-to-bottom book shelf arrangement; and an explanation of the Dewey call number range signs at both ends of each stack. I told the students they would be using their new knowledge of the Dewey classification system to perform two timed book searches. I described the book search procedure and told them that I would start a timer when I handed them each card. I asked them not to run or help each other.

The purpose of the book searches was to find out if students could remember the ten Dewey categories and the types of books found in each category. I created search cards based upon books on the shelves, but I made the search requests general so a number of books on the shelf could satisfy the search request. Rather than asking for "A book about maple trees", for example, I created a search card asking for "A book about trees." I organized the search cards so each student had to look in different parts of the collection at some distance from each other. For example, search card one asked for a book about Jewish holidays (200s- Religion) and search card two asked for a book about history (900s- Geography and History). I did this to minimize the possibility that students could accidentally find a book while looking for another.

I timed two students at a time during the first class book search. I allowed students to search as long as they wanted to before giving up and because some students spent as much as four minutes looking for their books, I timed three students at a time during the second class' book search. After their session in the media center, I led the students back to their classrooms where I administered the post-test which took about 10 minutes for the students to complete. A day later I administered the student survey in each classroom. Students completed the survey in 5 to 10 minutes. After collecting the survey, I individually interviewed six students from each class in the hallway outside their classrooms.

Results and Analysis

The majority of the students exhibited high levels of interest and engagement in the tutorial, worksheet and book searches. This high level of involvement did not result in uniformly high levels of achievement in the worksheets, book searches or post-tests, but the students' interest in the tutorial and book searches was marked. The results of my data collection are presented in the order in which they occurred.

The Tutorial and Teacher Observations

In the computer lab, students from the first class were attentive and able to keep up with me as I proceeded through the tutorial. A few students progressed through the tutorial ahead of the class. There were no behavior or computer problems. The passive observer teacher did not think any of her students had difficulties with the tutorial and observed that they were "very attentive."

Most of the students in the second class were attentive and able to follow as I worked through the tutorial; however, there were problems that hadn't occurred with the first class. A group of four students in a back row tried to socialize during the session and had to be spoken to. One student encountered pop-up problems on her computer which impeded her progress at several points during the tutorial. Another student's

computer was slow to load pages and this compromised her progress and ultimately her attention to the program. The teacher observer noted that students were sometimes off-task because of talking or because they took longer to read each page, then fell behind and needed help navigating to the page being discussed.

The Dewey Worksheet

The Dewey worksheet (Appendix A) was completed by 39 of the 41 students who participated in the study. It provided the first data about what students had learned from the tutorial about the Dewey classification system. The students worked diligently to match the 14 hypothetical titles with the correct Dewey classification categories in the Word Bank at the bottom of the worksheet. Many students quickly filled in the categories they were sure of and then went back to work on those they were not sure about. Although I asked them to do their own work I observed some students helping each other.

The average score on the worksheet was 58%. More than half of the students correctly identified 10 of the 14 titles. The majority of students matched the titles with clear subject area clues. For example, most students correctly matched titles 11 (79%) and 12 (87%) whose titles had Word Bank words. Title 11, *North American Indian Sign Language* was readily matched to "400 Languages" from the worksheet Word Bank by 79% of the students. Eighty-seven percent of the students matched title 12, *Psychology for Kids* with its category "100, Philosophy, Psychology." Students also matched two of the three history books correctly (titles 1 and 4), but 72% of the students misidentified title #9, *The Titanic Sinks* because they failed to identify it as a history title.

Most students failed to identify three titles (#s 3, 7, and 10) related to specific points in the tutorial. Title #3, a folktale was incorrectly identified by 90% of the students who could not remember that folktales are in the social sciences (300s). Title #7, *Cookies for Christmas,* is an applied science title. The tutorial had several pages describing the difference between the natural (500s) and applied sciences (600s) and cookbook titles were given as examples of applied science books. Twenty-one percent of the students remembered this. It is interesting to note that most (74%) students were able to identify the natural science title (#8 *Kid's Guide to Insects and Spiders*). Most students (62%) failed to match title #10 (*World Book Encyclopedia) correctly,* forgetting that encyclopedias are put in the general knowledge (000s) Dewey category--another explicit fact from the tutorial.

Table 1: Dewey Worksheet Results

Worksheet Title #	Dewey Category	% Correct Response
1	900	87%
2	700	56%
3	300	10%
4	900	64%
5	800	54%
6	700	85%
7	600	21%
8	500	74%
9	900	28%
10	000	38%
11	400	79%
12	100	87%
13	200	54%
14	700	82%

The Book Searches

All of the students were eager to do their book searches and most appeared confident as I gave them their first search card. A total of seventy-four book searches were conducted by thirty-seven students. Twenty-one students completed 27 successful searches in an average of 2.31 minutes. Ten of these searches were completed in one minute or less. I had originally intended to limit students' search time to a specific number of minutes, but I thought using the timer would cause students to find their books quickly and give up when they couldn't find them. While a few (8 students) gave up after less than 3 minutes of searching, most kept searching even though they expressed frustration as they continued to look for their books.

Our students spend the majority of their time accessing books in the Accelerated Reader collection of the library. The book searches gave students an opportunity to explore readings and resources outside this collection. One student commented, "I didn't know you had a Bible here!" as he searched for one of his books. Some students showed ingenuity as they tried to find books on their topics when they could not remember the Dewey category. One student offered a book about Chinese crafts for a book about Jewish holidays and another submitted *The Magic of Oil and Industry* as a fairy or folk tale. Despite the frustration many of the students experienced when they failed to find their books, they appeared to enjoy the exercise.

The Pre- and Post-tests

As shown in Table 2, students' post-test results showed gains in four of the eight concepts taught by the tutorial. After using the tutorial, more students knew what the Dewey classification system was and how many categories it had. After the instruction, more students could also describe the general-to-specific rule and the drop-back theory. Students also showed gains in their knowledge about Melvil Dewey. Prior to using the tutorial, most of the students knew the difference between fiction and non-fiction. The pre- and post-test results showed a decline in this understanding. Students also showed a decline in their understanding of library bookshelf arrangement. After the tutorial a few less students understood that fiction books could have numerical call numbers. The most dramatic difference between pre- and post-instruction knowledge was shown in students' understanding of how fiction books are shelved. I will discuss these apparent setbacks later in this paper.

Table 2: Pre- and Post-test % Correct: Comparison by Tutorial Concept

Concept	Pre-test	Post-test
Define the Dewey system	73%	83%
# of Dewey categories	22%	41%
General-to-specific rule and Drop-back theory	46%	56%
What Melvil Dewey did	17%	37%
Fiction and non-fiction	88%	83%
Bookshelf arrangement	73%	61%
Fiction can have numerical call numbers	80%	78%
How fiction is shelved	90%	17%

Student Surveys and Interviews

The day after taking the posttest, forty students answered six Likert-type questions about their attitudes toward the *"Do We" Really Know Dewey?* tutorial and whether they thought they had learned from it. More than half (55%) of the students agreed very strongly or strongly that the tutorial looked like an interesting site when they first logged on. Fifty-seven percent also agreed that the tutorial kept them interested from beginning to end. Sixty-five percent of the students agreed that the lesson was easy to follow. Forty-three percent strongly disagreed that they got bored during the lesson, although 13% strongly agreed they were bored and 15% were neutral. Most (75%) of the students very strongly or strongly agreed that they understood most of the words used in the tutorial and 85% agreed very strongly or strongly that they had learned something new from the tutorial.

The twelve student interviews revealed more information about students' reactions to the tutorial. Students were first asked what they liked about using the tutorial. Five students said they liked learning about how books were organized in libraries. Three students said they liked it because they thought it would help them find books in the library. One student liked learning about Melvil Dewey and another student liked the pictures in the tutorial. One student liked "everything" while another couldn't think of anything they liked about it. When asked what they disliked about the tutorial, nine students said there was nothing they didn't like about it. One student said she didn't like "the numbers" and another said that "some of it was difficult." Another student disliked the lack of time he had to use the tutorial: "We breezed through it, and it was only 2 days!" The same student answered "no" when asked if the tutorial had helped him with the book searches. Another student said it had helped "sometimes" and ten thought it had helped them with their searches. One student commented, "Yes it did a lot because before I joined the project, I used to be looking for the title instead of the author's last name." Another student said that learning how books were shelved helped her with the book searches. The final survey question asked students if the tutorial had helped them learn anything about the Dewey classification system. Ten students said yes and two students said no.

Conclusions and Implications
Did the tutorial help students learn?

The purpose of this research project was to find out how well fifth-grade students could learn about the Dewey classification system by using the online tutorial *"Do We" Really Know Dewey?* Comparisons of the students' pre- and post-tests indicate modest gains in their knowledge about Melvil Dewey and his classification system. On their pre-tests, 17% of the students guessed correctly that Dewey had invented the classification system bearing his name; and after using the tutorial 37% knew that Dewey was also a librarian who established the American Library Association and the first library school in the United States. Before the tutorial, 22% of the students knew the number of Dewey categories and this percentage grew to 41% after instruction. Students' understanding that the system allows general-to-specific and specific-to-general book organization and searching grew from 46% to 56%. These gains can likely be attributed to students' use of the

tutorial.

The pre- and post-tests also showed decreases in students' knowledge in four concept areas: the difference between fiction and nonfiction; bookshelf arrangement; how fiction books are shelved; and the fact that fiction books can have numerical call numbers. I believe these declines can be attributed to problems with the wording on my pre- and post-tests.

Students' understanding of the difference between fiction and non-fiction slipped from 88% to 83%. This slight decline may have been due to students' carelessness while taking the post-test. A few (5%) of the students may have assumed that the pre- and post-test questions about the difference between fiction and non-fiction were the same and they were not. The pre-test question read: "Fiction books are (A) about true facts (B) about made-up stories." The post-test question read: "Non-fiction books are (A) about true facts (B) about made-up stories." Since students are taught the difference between fiction and non-fiction from the time they are in kindergarten, I am inclined to attribute the lower post-test percentage to students' failure to read the question carefully.

Differences in pre- and post-test wording may also account for the 12% decline in the number of students who knew how to read bookshelves. Students who answered this question correctly on the pre-test would have answered the same question incorrectly on the post-test if they failed to read it carefully. The pre-test question asked "In library book stacks, books are shelved from left to right. True or False?" and the post-test question read: "In library book stacks, books are shelved from right to left. True or False?" Sixty-one percent of the students answered correctly on the post-test, compared with 73% on the pre-test.

Ninety percent of the students knew how fiction books were arranged on the pretest, while only 17% knew on the post-test. I attribute this apparent loss of knowledge to differently-worded pre- and post-test questions and student carelessness. The pre-test read, "Fiction books are shelved alphabetically by their author's last name. True or False?" and the post-test question read, "Non-fiction books are shelved alphabetically by their author's last name. True or False?" A similar change in the wording of the pre- and post-test questions about the fact that fiction books can have numerical call numbers probably caused the 2% decline in the percent of students who understood this concept after the post-test.

The Dewey worksheet results revealed fewer gains in students' knowledge as a result of the tutorial. More than half of the students could match 10 of 14 titles with the correct Dewey categories from a word bank at the bottom of the sheet after using the tutorial. Students were most successful with the worksheet titles whose subjects they could readily identify, such as the language, psychology, history, recreation and craft books. Students were less successful remembering specific facts from the tutorial, for example: the Dewey categories for encyclopedias and folktales and the fact that cookbooks belong in the applied sciences category.

Twenty-one of the 37 students conducted successful book searches in an average time of 2.31 minutes. It is possible that some of these successful students didn't remember the Dewey category numbers of the books they were looking for and that they found them by roaming through the shelves for two minutes. However, 8 students completed ten of the successful searches in less than a minute. It is unlikely that these students found their books by accident in such a short time. It is more likely that they remembered the correct Dewey category numbers from the tutorial. Ten of twelve students I interviewed said they thought the tutorial had helped them with their book searches.

The student surveys indicated that most (85%) thought they had learned something new from the tutorial. Seventy-five percent understood all of the words used in the tutorial and slightly more than half (57%) said the tutorial kept them interested from beginning to end. The students' teachers and I found that most of the students were attentive and engaged while using the tutorial.

Most of the students enjoyed taking part in this research project. The surveys showed that 85% thought they had learned from the tutorial and 8 of the twelve students interviewed said they liked learning how books were organized in libraries. This finding indicates an area of interest that is not currently being addressed.

Limitations of this study

The main limitation of this study is its short duration. As one of the students I interviewed put it, "We breezed through it, and it was only 2 days!" I originally intended to spend two sessions in the lab, but testing and other events made this impossible. Given the students' positive reactions to the tutorial and the successes they were able to achieve after one forty-minute session with it, I think they could have learned more if they had been given more instructional time.

Another limitation of this study is the changed wording in the pre- and post-test instruments. If the

wording of the post-test questions had not been changed, it may have been possible to get more reliable results relating to the differences in student's knowledge of 4 of the 8 concepts taught by the tutorial: the difference between fiction and nonfiction; bookshelf arrangement; the fact that fiction books can have numerical call numbers; and how fiction is shelved.

The findings of this study suggest that the online tutorial *"Do We" Really Know Dewey?* was somewhat effective in teaching students about the Dewey classification system and that most students enjoyed using it. To explore the effects of increased student access to the tutorial, a subsequent study might include two introductory lab sessions instead of one. It might also allow students access to the tutorial while they are completing the Dewey worksheet and conducting their book searches. It is possible that this increased access would improve students' learning.

Students' enthusiasm for this project suggests that more hands-on use of the collection should be incorporated into the curriculum. These findings will be communicated to my learning community through a presentation and display in the media center.

References

American Association of School Librarians & Association for Educational Communications and Technology. (1998). *Information Power: Building Partnerships For Learning.* Chicago: American Library Association.

Cudiner, S., & Harmon, O. (2001). Comparing the effectiveness of different presentation formats for workshops on introductory library skills. *Research Strategies, 18(1),* 49-61.

Dewald, N.H. (1999). Transporting good library instruction practices into the web environment: An analysis of online tutorials. *Journal of Academic Librarianship, 25(1),* 26-32.

Georgia Department of Education. (1997-2005). Georgia's english/language arts performance standards. Fifth grade english/language arts. Retrieved April 8, 2005, from http://www.georgiastandards.org/langart.asp
Gibson, M.R., & Mazur, J. (2001). "It's funner now!" where online guidance stops and mentoring starts: Fifth graders' perceptions of doing research with the "Research Buddy." *Educational Media and Technology Yearbook, 26,* 93-114.

LeBlanc, S. A. (2001). *Using computer assisted instruction to teach information literacy skills: An action research study.* Retrieved February 3, 2005, from Valdosta State University, Department of Curriculum and Instructional Technology website: http://teach.valdosta.edu/are/Artmanscrpt/vol1no1/leblanc_am.pdf

Michel, S. (2001). What do they really think? assessing student and faculty perspectives of a web-based tutorial to library research. *College and Research Libraries, 62(4),* 317-32.

Moore, P.A., & St. George, A. (1991). Children as information seekers: The cognitive demands of books and library systems. *School Library Media Quarterly, 19(3),* 161-68.

Online Computer Library Center. (2004). Dewey is the world's most widely used library classification system. Retrieved February 19, 2005, from http://www.oclc.org/dewey/about/translations/default.htm

Thomas, N.P. (2004). *Information literacy and information skills instruction: Applying research to practice in the school library media center* (2nd ed.). Westport, CT: Libraries Unlimited.