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ABSTRACT

A case study investigated an instructional model that incorporated the personal computer and Hyperstudio (tm) software into an assignment to write and illustrate an interactive, multimedia story. Subjects were 21 students in a fifth-grade homeroom in a public school (with a state-mandated minimum 45% ratio of minority students achieved by busing in students from surrounding areas) in an affluent area in the southeastern United States. Students were instructed in the writing of interactive stories using the process approach to writing and the software. Results indicated that: (1) students' writing improved in quantity and quality; (2) students were more motivated to complete the assignment; (3) the computer allowed for greater flexibility in writing due to its nature as a word processing tool; (4) even a single computer can be effectively used in conjunction with the language arts curriculum in the classroom; and (5) there were inherent difficulties associated with integrating computer technologies into classrooms--many students did not have experience with computers, even those who do have experience may lack keyboarding skills, and finding time to accomplish such a project requires outside help. Findings suggest that computers can be integrated into classrooms, and that computers can be used to enhance writing instruction and improve the quality of written work. (Contains 11 references and a table of data.) (RS)

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Integrating the computer into language arts in a fifth grade classroom: A developing instructional model

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The current movement toward the integration of computer technology into every school classroom in the nation fueled by President Clinton's Goals 2000 education campaign has precipitated a number of important questions for teachers. How can computers be integrated into curricula that are already highly structured in terms of the content and the time required to teach them? How will time be found to learn to use this technology and to teach students to use it, as well? If funding for multiple computers in classrooms is not available, how can single computers honestly be used in a manner that will benefit education? Will the use of the computer actually contribute significantly to education? These are only few of the many questions that arise and, in light of a recent report from the U. S. Department of Education (1996), are critical to the emergence of the nation into the 21st century. The DOE report claims that ability to use the current technologies will be as important as the traditional skills of reading, writing and arithmetic. To meet the "Technology Literacy Challenge", the DOE lists four goals that must be fulfilled in order to allow our students to be technologically literate as we enter the next century:

1. All teachers in the nation will have the training and support necessary to help students learn to use computers and the information superhighway.

2. All teachers and students will have modern multimedia computers in their classrooms.

3. Every classroom will be connected to the information superhighway.

4. Effective software and on-line learning resources will be an integral part of every school's curriculum.

Theoretical information to answer these computer technology related questions in education is relatively new and predominantly unproved. However, there is a great deal of research--both current and past, as well as, a number of different uses of computer technology described in the literature. The outcomes of computer use are not always as positive as their proponents lead us to believe. Nicol and Butler (1996) reported that computers in British Columbia were underutilized because teachers were not knowledgeable in their use and could not justify how computer use fit into their curricula. Ragsdale (1997) reported that unexpected side-effects of computer use resulted in inability of students to complete learning tasks; for example, the length of time students spent on a program and teachers too involved with their own interaction with the computer to notice when a student needed help. Elkind (1996) cautioned that computer competence does not necessarily measure students' academic abilities. He also stated that computers cannot simulate the social experience of school, extending the description of computer use by Strickland (1992) as being machine-centered and drawing the attention of students to the computer, thus creating less child-centered learning environments. But on the other hand, Strickland also

reported that appropriate use of the computer in a whole-language based classroom enhances the language instruction because it is dynamic and exciting. And there are many other positive reports of computer use in classrooms. For example, Manning and Manning (1995) described the views of children on the appropriate uses of a number of elementary tools including computers. Shade (1995) describes the use of storyboard software in helping young children write and illustrate their own stories. Snyder (1995) determined that students using the computer for writing became more independent writers. There are also a number of books written to aid the teacher in the use of the computer. One of the most popular of these is Evans-Andris' An Apple for the Teacher (1996). One fact remains clear, computers are here to stay and what we do with them in the classroom is going to effect the abilities of students to meet the challenges of the 21st Century.

The purposes of this paper are to:

- describe the instructional model and explain how it incorporated the personal computer and HyperStudio™ software into an assignment to write and illustrate an interactive, multimedia story.
- discuss the difficulties relating to the implementation of the instructional model; including use of the computer, use of the software, and method of delivering the general instructions for the assignment to the class.
- describe the effects of a model of instruction in the language arts segment of a fifth grade classroom.

- discuss the success of the instructional method to motivate students to write and the quality of the writing produced.

Perspectives and Theoretical Framework

The premise that writing is a rigorous kind of thinking and a powerful learning tool (Alvermann, D. E., & Phelps, S. F., 1994) undergirds the instructional method described. In addition, the classroom teacher's need and desire to integrate the computer into the classroom was a driving force in the development the model.

The process of the project is one of applied research--to generate a solution to a specific problem (Patton, 1990); in this case, how to more fully integrate the computer into the language arts curriculum. Hence, as this paper is a rich description of a particular instructional method employed in a specific regular classroom, it is appropriately represented as a project description.

METHOD

Participants

The study was conducted in a 5th grade, public school classroom in the southeastern United States. The school is located in an affluent area and has a population of just over 400 students. The majority of students living within the school boundaries attend private schools. Approximately 50% of the students are transfers from surrounding areas, 30% of the students are bussed in from a predominantly African American community in order to maintain the state mandated minimum 45% ratio of minority

to Caucasian students, and the other 20% of the students live within the school boundaries. The researcher had been visiting the class and the school regularly since August, 1995 and the project was conducted from October, 1996 through January, 1997. All of the 21 students in the homeroom class were acquainted and comfortable with the researcher. They received language arts and math instruction from their homeroom teacher, and moved to the classrooms of the other two fifth grade teachers for social studies and science instruction.

Instructional Context and Teacher

The teacher believes in a very eclectic approach to teaching. She uses the tools that are most appropriate to the students in the current classroom. She based her teaching primarily on a holistic approach to learning, integrating reading and writing into all aspects of her teaching; but also using drill and practice type work on an occasional basis when the students in the classroom were more likely to benefit from that type of learning activity. She was also concerned very much by the need to integrate the computer into her classroom and consulted with the researcher, who subsequently, served as a member of the school's technology committee and a member of the technology committee of the local PTA. Her biggest concern was how to find the time to utilize the computer in her classroom.

Description of the Instructional Process

The researcher met with the class on four separate occasions during October of 1996 to instruct the students in the writing of interactive stories and use of the HyperStudio™ software. Subsequently, another 20 one to two hour sessions of work with individual groups were conducted in which the students were observed. In addition, the classroom teacher spent several hours each week in November and December working students through the writing process--drafting, editing, & revising their computer manuscripts. A final session in January of 1997 was held in which the books were shared. Specifically, the instruction followed the steps given below.

1. Students were reminded of the nature of an interactive story--at the end of specific passages, the reader chooses what will happen to the main character of the story and is directed to the appropriate page. The branching nature of hypertext software lends itself particularly to this type of story.
2. The students helped to create a model story using a specific story outline and the theme of shoplifting. Together with the professor, they wrote a short, representative story.
3. Students were instructed in the use of the HyperStudio™ software by going through the tutorial that accompanies the program. This was done as a group with the university professor as facilitator.
4. The 21 students in the class were then divided into 7 groups of 3 students each and were instructed to create

their own story based on some value of importance to the group members.

a. They chose a value, created a summary of the characters in their story, an outline of the branches their particular story would take, and began to write the first part of their story on paper.

b. Groups were then scheduled to begin writing on the computer and to incorporate video, pictures, and sounds into their stories. Scheduling was somewhat difficult since most of the time, there was only one computer in the classroom, although three computers were available on some occasions. In addition, there was a need for the teacher or professor to monitor student progress and help with questions regarding software and computer use.

c. Students edited and self-critiqued each story in preparation for sharing with their peers.

d. Once stories were complete, including editing, students shared their story with the entire class by reading the story as it was projected on a television using the computer as the video input.

Data Collection and Analysis

Since this was a descriptive case study of a single classroom, the most appropriate methods for gathering data were qualitative in nature and came from a number of appropriate sources: notes of the planning conferences for the project conducted between the researcher and the classroom teacher; observation notes compiled as the students were engaged in the process of writing their books; notes from post writing session dialogues between the researcher and teacher, the researcher and the students, and the teacher and the students; the pencil and paper rough drafts and computer generated final drafts of the interactive books (seven rough drafts and seven final drafts written by collaborative groups of three students each) written by the students; observation notes gathered during all phases of the project, including the final phase in which students shared their books with their classmates; and notes from a final debriefing session between the researcher and the teacher. Notes were recorded immediately after each encounter with the students and teacher. These notes were analyzed using qualitative methods for patterns of behavior that might indicate the effects of the use of the computer on students and their writing. Discrepant cases were also sought during the data analysis, but none were found. This may be due, at least in part, to the small number of subjects.

RESULTS

The positive effects of this project were noticeable in the first stages. For example, during the second session in which the

students went through the modeling of the process of writing an interactive story, students questioned the type of characters that could be used. One boy asked, "Should the characters be real or fictional, or maybe even animals?" Similar questions regarding the setting were also asked. One of the girls wanted to know, "Should the setting be realistic?" The thinking caps were on. In the model story, they chose to use shoplifting as the value-based topic. They chose a black panther named Samuel as the main character. Since, the students believed that these animals can be found in Africa, they felt that the setting should be consistent with their belief and chose Lagos, Nigeria. Since the topic was shoplifting, a mall was the logical site of the specific action. Other animals were chosen on the basis of the student's belief that they, too, were indigenous to Africa--the store owner was a monkey, the eye witness to the crime was a Toucan named Sam, the Policeman was a tiger.

In the end, students were very successful in their writing. All seven groups completed the project, writing an well edited interactive story. Table 1 summarizes the major characteristics of the seven stories.

Group #	Topic	Approx. length	Audio enhancements	Video/picture enhancements	# Hypertext links
1	Following rules	175 words	6	7	5
2	Taking revenge	510 words	7	8	4
3	Obedience	205 words	7	4	4
4	War vs. talk	395 words	12	5	8
5	Trespassing	475 words	7	7	6
6	Being friends	200 words	7	7	6
7	Stealing	185 words	5	3	3
Average		306 words	7.9	5.6	5

Table 1. Summary of HyperStudio™ generated interactive story characteristics

In this table, the last three columns indicate the number of times students used specific computer enhancements in their stories. Audio enhancements are sounds associated with buttons to turn pages and follow hyperlinks, video/picture enhancements show the number of times students added computer generated graphics or video movie clips to embellish their stories, and hypertext links indicate the number of occurrences of using the branching capability of the HyperStudio™ program to move to the different places in the story rather than go from page to page in linear fashion. In addition to these features, each story had a title page at the beginning and a page giving credit to those who helped put the story together at the end. The credits were set up in an

animated fashion to roll up the screen just as the credits in a movie are viewed. the stories themselves were all free of errors in punctuation, grammar, and spelling as a result of the writing process that was used to write them. Each story also followed a logical order in spite of the difficulties of developing hyperlinks to navigate through it.

In addition to these, objective measures, the teacher was convinced that these students learned more about writing than students in previous years had learned. She was also sure that these stories were longer, but there was no way to confirm this. These subjective assessments of ability and quality were based on the teacher's many years of classroom experience. In our post project interview, she indicated that during the course of the project, students seemed to work harder on their other assignments in order to be able to work on their stories at the computer and were always asking to get with their groups to continue their story writing. They were also excited to be involved and especially excited to share their stories with their peers. This can best be exemplified by the young man who said, "We can't go until we're done with this book!" when the bell rang to go home on the day the stories were shared with peers. No one moved for two more minutes, until his group was finished.

Difficulties encountered

Although the project went fairly smoothly and we finished by our December deadline with the writing, there were some difficulties encountered. Some of the students tried to copy the model story as they started their story writing projects. They

had to start their own stories more than once before they came up with a topic of their own. In the end, one group still chose to deal with stealing which is very close to shoplifting. Another difficulty we faced was the students' lack of keyboarding skills. This effected the way the groups were chosen and made the writing process slow and cumbersome for some of them. We found that some of the students tried to rely on previously learned computer gaming skills. They could locate some of the keys o the keyboard with little or no difficulty, but keys that they had not used in playing games were often difficult to find. Another problem we faced was the difference in students' concepts of values and value judgments and the resulting difficulties in reaching group consensus. Finally, we found that group instruction in the use of the computer in a lecture format had limited value. The students learned much more quickly and efficiently through hands-on work with the researcher or teacher there to guide them through difficulties.

CONCLUSIONS

Conclusions drawn from this project are important to teachers in all fields as they attempt to take advantage of the burgeoning technologies, especially computers, available for education and move into the 21st century. The specific conclusions drawn from this project are:

- Students writing improved in quantity and quality; there was greater attention to detail, more thought was put into the creation of these interactive stories, and the length of the written assignments was longer.

- Students were much more motivated to complete the assignment. This was a result of two factors: first, they were allowed to use the computer; and second, they were able to 'publish' their work by sharing it with the class.
- The computer allowed for greater flexibility in writing, due to its nature as a word processing tool. Story passages could easily be rearranged in terms of sequencing, editing was more easily and efficiently accomplished, and multimedia resources were more easily incorporated into the stories which made them more entertaining.
- Even a single computer can be effectively used in conjunction with the language arts curriculum in the classroom.
- There are inherent difficulties associated with integrating computer technologies into classrooms: many students do not have experience with computers; even those who have experience may not have necessary keyboarding skills (groups had to be established so that at least one group member would have the prerequisite computer skills); and finding time to accomplish such a project requires outside help--the classroom teacher can't do it all.

Educational Importance

Like all other tools available to teachers for the enhancement of education, training in the use of computers and software prior to classroom use is required. Students must also be prepared to use the computers and software in order to take

advantage of technological advances. This instructional method is important to education, because it establishes the that at least one method of integrating computers into classrooms in a manner that allows teachers to make use of the computer as a learning/teaching tool, rather than as an item that takes up space or is used solely as a reward or diversion for students who are already motivated. This project also showed that computers can be used to enhance writing instruction and improve the quality of written work. The work described here is also significant because it identifies some of the pitfalls that may be encountered in the process of integrating computers into classrooms and proposes some solutions that might be employed to avoid them.

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