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AUTHOR Hood, Laura M.
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ABSTRACT

A study investigated the effects on second graders' writing due to their participation in an electronic mail letter exchange. Subjects were 14 second-grade students who participated in a project on Virginia's Public Education Network, where they corresponded with a person in the character of Winnie-the-Pooh. A pre-test/posttest design was used in a 5-week interval. A rating scale was used to evaluate the students' writing. The students' writing was then grouped to correspond with the domains on the scoring system used for the Virginia Literacy Passport Test. Results indicated that the subjects scored higher in the composing and style domains on the posttest than the pretest, but lower in the usage domain and sentence formation on the posttest than the pretest. Results also indicated no change on the mechanics domain scores. Surveys of the subjects revealed largely positive attitudes towards the project. With future research, projects like this could be improved and become even more effective in promoting student writing. (Contains 20 references and 4 figures of data. The rating scale for the pre-test and posttest, the rating scale categories of the Virginia Literacy Passport, and the student opinion survey are attached.) (RS)

Effects of Computer Correspondence on Student Writing

Laura M. Hood

The Curry School of Education

University of Virginia

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Running head: EFFECTS OF COMPUTER CORRESPONDENCE

Abstract

The effect on second graders' writing due to their participation in an electronic mail letter exchange was investigated. The 14 second-grade subjects participated in a project on Virginia's Public Education Network (Va PEN) where they corresponded with a person in the character of Winnie-the-Pooh. A pre-test/post test design was used in a five week interval. A rating scale adapted from Allen (1992) was used to evaluate the students' writing. The students' writing was then grouped to correspond with the domains on the scoring system used for the Virginia Literacy Passport Test. There was statistical significance found in the domains of composing, style, and usage. Surveys of the subjects revealed largely positive attitudes towards the project.

Author's Notes:

I would like to thank some of the people who have helped with this project. First, I would like to thank Meneta Deaton, my cooperating instructor, for allowing me to join her students' experience and for answering all of my questions over e-mail.

Also, I would like to thank my University Supervisor, Marilyn Cook, for her help with design and editing.

I owe the idea and the existence of the Elementary Books Project to April Lloyd and Jeradi Hochella. Without their creativity and dedication, this paper would not have been possible.

I would like to thank Ruth H. Hood, Jim Martindale, and Alan Hickerson for responding to my last minute calls for technical advice.

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Any questions or requests for information about this field project can be mailed to:

Laura Hood
HC 72 Box 413
Locust Grove, VA 22508

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The Effects of Computer Correspondence on Student Writing

Most people will agree that computers are an important part of life today and will be in the future. It holds then that students in today's classrooms will benefit from learning about computers and how to use them.

Technology has already begun to change the look and instruction in classrooms across the country. Computers are being used in many subject areas from science to social studies to language arts. As a result, researchers have been studying the impact and effectiveness of computers and other technology in their instructional capacities. Over the past decade, there has been a lot of research and many pilot projects specifically on writing using computers and other technology in the classroom.

One pilot project which will be looked at in detail is the Elementary Books project on Virginia's Public Education Network (VA PEN). In this project, computers are a crucial link between writing and its purpose. Students are provided with a writing environment where the writing has a clear purpose, in this case communication. Then, the effects this interactive communication with a fictional character has on their writing will be investigated. Specifically the areas of composing, style, sentence

formation, usage, and mechanics will be analyzed. Also, the link between writing and literature that the subjects make in their letters will be investigated.

After this experience of purposeful writing, students should show improvement in their writing both in the ideas they write and the technical aspects of their writing. Also, the letters should contain a larger number of words and references to the source book.

Literature Review

Computers and writing

Much of the earlier research focused on using word processors in writing instruction. Some of the findings showed that using word processing programs helped in the writing process. In the first place, writing on the computer was easier and faster (Norris, 1990). In a study by Adams (1986, pp. 34), a fifth grader commented that "[w]riting on the computer is easier because it seems more like talking". Using computers, students tended to write more ideas down, experiment more with the language, and write across the curricular areas (Moore, 1991; Adams, 1986). They were more willing to rework drafts because revising was less troublesome with the ability to make changes quickly and easily on a word processor (Adams, 1986; Adams, 1987). This ease of manipulation created a feeling of mastery over the writing (Norris, 1990). Suddenly, the editing process was easier and more rewarding to students (Norris, 1990).

Telecommunications

Telecommunications is an advance in technology which has the potential to completely alter the way people communicate. With increasing numbers of people gaining access to the networks and an expanding range of information available, the instructional applications

are extensive. It is possible to access NASA's network, to read the day's newspaper online, to communicate with students, teachers, and community members, and to access databases from universities and companies all over the world. Rickelman and Henk (1990, pp. 418) said it clearly when they wrote "[p]erhaps no other area holds a greater potential for use in schools of the future than telecommunications."

One of the critical aspects of telecommunications is the fact that it requires simultaneous use of related language skills. In the average verbal conversation, a student must both hear and speak in order to communicate. Telecommunications, on the other hand, is a textual medium. Therefore, a student must read and write to converse or to use the resources available on the network. The listening and speaking aspects of language also have use in telecommunications when students work in small groups around the computer. Bull and associates (1991) contend that face-to-face interaction and computer-mediated communication greatly enhance one another. In that type of situation, all four aspects of language become important.

Telecommunications and writing

One area in particular where telecommunications has been used in the classroom is writing. The world which can be opened up to students through telecommunications can provide motivation, purpose, and an

audience for student writers. Two common forms of telecommunications used to teach writing are electronic bulletin boards and electronic mail. Both give students opportunities to be creative, to learn, to teach, and to interact with people in other states and countries. These electronic dialogues are informal and conversational in style. They allow students to focus on their thoughts and how they can express them more clearly (Moore, 1991). When the goal is true communication, it becomes more important for the students to explain themselves coherently in order to communicate in writing what they want to say.

Researchers have also commented on the ability of telecommunications to motivate the students (Burrall, 1992; Moore, 1991). The knowledge that the writings will be used to communicate with other students through the modem is a stimulus to get the students interested (Burrall, 1992). According to Dolores Norris (1990), this audience gives the writing process a purpose by giving students incentive to revise and edit their works. In a pilot program implemented by Jean Casey (1990), the students were more involved in what they were writing when they knew it would be read by a real audience.

Through the use of telecommunications, students have been inspired to improve in additional areas such as geography, research, and computer literacy (Burrall, 1992). As documented by Roberts and

associates (1990), the affective domain has also been an area positively influenced by the use of telecommunications. In addition to self-confidence, students' attitudes toward writing and language can be improved (Newman, 1989).

Innovative Programs

***Quill**

Although no longer commercially available, Quill was a program designed to help students learn to write (Rubin, 1990). Two writing tools, a planner and a word processor, were supplied in addition to two writing environments, a library and a mailbag. By using the different segments of the program, a student would be able to generate and organize ideas, type them into the word processor, share the writing with a group on a bulletin board, and send communication to individual students. The program began to tap into some very important aspects of good writing such as critical reading and audience awareness.

***KidLink**

This program linked students with the characters from the books that they read in class (Casey, 1990). The students wrote to the characters, played by student teachers, professors, or master teachers, on the network. The students were able to increase their story-related knowledge such as themes and story development by communicating

actively with the characters. Also, due to the level of personal involvement, students will remember the experience for a long time.

***Summer Reading Program**

This is a program which was implemented to study the effects on summer reading and writing of supplying students with computers, telecommunications equipment, and access to instructional resources at home (Erickson et al., 1992). Forty fourth graders from an inner city school were given the equipment and training necessary to access four reading/writing programs from their homes. The students were allowed to choose freely whether or not to utilize any or all of the programs available. The researchers found that the students chose to spend over two hours per week during their summer vacation utilizing the programs available to them. This data showed that summer reading and writing were promoted by telecommunications at home.

***The Reading/Writing Connection**

This outreach program linked a graduate class with a local elementary school in an interactive telecommunications experience (Moore, 1991). Each student was paired up with a graduate student and given a shared conference to get to know one another as well as to discuss the book Superfudge. The students were able to interact both socially and academically with their partners. Their motivation and

interest increased as the students realized that someone valued what they had to say. During the exchange, the graduate students and teachers modelled methods of asking and answering questions with supporting details from the book. The researcher began to notice the teachers' vocabulary being used in the responses written by the fifth graders.

***Pediatric Psychiatry Unit**

This program brought students in a pediatric psychiatry unit classroom together with students in special education classrooms in four states and Canada (Mueller, 1992). The program gave the students an opportunity to communicate anonymously with peers through writing. Both the rapid turnaround time for correspondence and the chance to give a bias-free impression to peers contributed to student interest. For all of the students, this was a chance to have meaningful communication with some sense of anonymity where their disabilities were not apparent. The students also learned to elicit responses from their computer friends through questioning.

***Writer in Electronic Residence**

This unique program linked teen-aged students with a professional poet with the goal of encouraging writing and communication (Owen, 1990). Original poems were created by the students and posted on a

computer conference with the option of anonymity. From there the poet could respond to the poems with suggestions, constructive criticisms, complements, and his own insights. An additional component of the program which researchers found to be more important than originally anticipated was peer response. The other students also exercised their opportunity and ability to comment on the poems, ask questions, and discuss the writing with the student-writer on the computer conference. As a result, the student-writers were able to get an idea of the impact their writing had on an audience as well as receive constructive suggestions.

Virginia's Public Education Network

This program was created in 1984 as Teacher-LINK through a joint partnership with the Curry School of Education at the University of Virginia and IBM. Its original purpose was to establish a network which would support the student teaching process (Bull et al., 1989). The creators sought to establish an electronic, academic culture to supply teachers with an instructional tool, to give them a way to communicate with one another in an effort to reduce some of the isolation, and to allow the student teachers to participate in the educational community (Bull et al., 1991).

In time, the project has expanded to include not only the teachers,

professors, and student teachers, but also members of the community and the students themselves. It has become a statewide program used in many schools allowing even the rural schools the opportunity to benefit from the academic community. Volunteers help to develop and maintain the on-going projects offered on the network.

As the program extended to schools across Virginia, Glen Bull and his associates made it one of their goals to give all users the ability to access the network by making a local call. They wanted the school districts to share a common mail interface and they set up "nodes" across the state to accept the local phone calls.

Since its creation, the electronic academical village has served to:

-reduce feelings of professional isolation,

-provide technical assistance for infusing computer technologies into traditional curricular instruction,

-allow teachers to share local instructional resource information,

-assist in the preview and planning of student teaching internships,

-and provide emotional support for students during their first full-time teaching experience. (Bull et al., 1991, p.43)

Today Virginia's PEN consists of many resources and projects

available to teachers and students. Some of these are electronic mail, electronic news and discussions groups, archives of documents and software, online reference manual, University of Virginia and Virginia Polytechnic Institute library catalogs, internet services, and the Electronic Academical Village.

The Electronic Academical Village is divided into "pavilions" which are established by subject area. Some of these pavilions are History, Math and Science, Multiculturalism, Physics, and Language Arts. Each pavilion has one or more volunteers called curators who organize, oversee, and expand the projects offered on their respective pavilions.

Language Arts Pavilion

Officially created in the summer of 1993, the Language Arts Pavilion, in particular, offers many special projects and resources for teachers. According to Jeradi Hochella (1994), a curator for the pavilion, one of the main goals of the pavilion is to "foster a place for literacy with an authentic purpose for reading and writing". The welcoming letter from the curators (1993), Jeradi Hochella and April Lloyd, to anyone who uses the pavilion includes other goals such as encouraging instructional uses of VA PEN and supplying teachers and students with items to support and enhance their curriculum. In addition to supplying professional resources for teachers, this is done by giving students an opportunity to

"converse with characters from children's literature, participate in projects with other classrooms across Virginia, and have a 'publishing outlet' for their stories and poetry" (Hochella & Lloyd, 1993).

Elementary Books

The Elementary Books project was the seed which eventually grew into the more expansive Language Arts Pavilion. The project began when April Lloyd established a conference where the students in her class could write to fictional characters from the books they read in class. In the beginning, Ms. Lloyd was the sole person responding as the characters. Eventually, this became an overwhelming task for one person. In September 1992, Ms. Lloyd made a connection with Jeradi Hochella, then a high school teacher. Immediately, they began to work together as Ms. Hochella's high school students took over some of the characters' personalities to respond to the elementary students. First, Ms. Hochella's students became Bunnicula, then Mr. Popper.

Since then, the number of characters on-line has expanded, as has the number of letters posted to these characters. Ms. Hochella feels that this is a sign that the project is getting "some kind of sustained use, not just a flash in the pan" (1994). The teachers and the community have responded favorably to the project. However, Ms. Hochella commented that she feels the impact of the program has not been as

wide-spread as it could be. As it spreads by direct exposure and word-of-mouth, she feels more people will decide to use the project. Even now, more and more people are beginning to contact the curators because they want to become involved.

Method

Subjects

Fourteen second grade students served as subjects. All subjects were members of the same class in a local city elementary school. The students ranged in age from six to nine years old. The class was heterogeneous in that the students' ability levels, race, and economic backgrounds of the class varied. Students' participation in the study was a required part of the regular instruction in the school's computer lab. The class consisted of 19 students, however 5 students were not included in the study due to mortality.

Materials

The first necessary material for the set-up of this particular project is a computer for each child and at least one time period during the week for the students to work in the computer lab. At least one of the computers must have a modem in order to access the network. The classroom teacher or the computer teacher must have an active account on VA PEN. A volunteer to be the fictional character and respond to students' letters is also necessary. This volunteer can be a member of the community, a teacher or administrator, an older student, or even the teacher him/herself. Also, a rating scale for writing appropriate for second-grade writing is necessary. In this project, the rating scale used

was adapted from a scale by Allen (1992).

Procedure

The study consisted of a pre-test and a post test which occurred five weeks apart. Both the pre-test and the post test were done in the school's new computer lab. Prior to the study, the class had a few sessions in the lab where they explored some of the programs available and became familiar with using the computer and its related hardware.

The pre-test was given after several of these introductory sessions in the lab. It consisted of giving the students a writing topic and allowing them to type their writing directly into a word processing program. The students were instructed to write a letter to one of several characters in a book they had recently read called Julius: The Baby of the World by Kevin Henkes. This letter was introduced as a practice letter and the class was given no reason to expect any response from the character. The class was given some basic instructions on letter writing such as form and types of information which might be included.

The treatment was initiated during the computer lab session immediately following the pre-test session. The treatment consisted of the students' participation in a project on the Elementary Books section of VA PEN. The project was one in which the class was given the opportunity to communicate with a fictional character. Since the students

had been reading some of A. A. Milne's stories in class, they were given the opportunity to correspond with Winnie the Pooh over the network.

During their weekly session in the computer lab, students were instructed to write letters to Pooh. They typed the letters into a word processing program and then saved it on a floppy disk. After school, the teacher logged on to VA PEN and posted the students' letters. At some point during the week, the volunteer logged on to the network, read the students' letters, responded to each student individually, and posted the responses on the bulletin board. Again the classroom teacher logged on and printed a copy of each response letter from Pooh to her students. At the next computer lab session, each child was given the printed copy of Pooh's response to him/her and had the chance to write another letter to him.

The post test data was collected after these interactions had continued for five weeks. The post test was the third letter from each student to Pooh in the interchange. Therefore, the interchange for this project consisted of Pooh's original letter to the class, a first letter from the student, a response from Pooh, a second letter, a second response, and a third letter.

Each paper was evaluated in terms of the number of words and the number of references to the book included in the letter. Then two

graders used the rating scale (see Appendix A) to score both the pre-test and the post test. Prior to grading, the raters discussed some of the specific qualities they would look for in order to decide upon a score in each category. Then the papers were scored and the results were compared and discussed. The raters' scores for each section were averaged together.

The scores were then grouped to correspond to the method used in grading the Virginia Literacy Passport test (see Appendix B). In the content section of the rating scale, interest, coherence, and unity were combined into one score comparable to the composing domain of the Literacy Passport test. The development and word choice sections were combined into one score comparable to the style domain. From the Mechanics part of the rating scale, three separate score groupings were made to correspond with the Virginia Literacy Passport test. Sentence formation was the score from the sentences section of the rating scale. The usage domain was covered in the grammar section. Then, paragraphs, capitalization, punctuation, and spelling were combined into the mechanics domain.

After the post test data was collected, each student in the class was given an opinion survey about language arts and the particular experience of writing to Pooh (see Appendix C).

Results

As shown in Figure 1, the subjects scored higher in the composing domain on the post test (M = 3.62) than they did on the pre-test (M = 3.16), $t(13) = -3.14$, $p<.01$. This was also the case for the style domain, see Figure 2, with the subjects scoring higher on the post test (M = 3.59) than the pre-test (M = 3.22), $t(13) = -2.30$, $p<.05$. As Figure 3 shows, the usage domain had the opposite results as the subjects scored higher on the pre-test (M = 4.92) than they did on the post test (M = 4.21), $t(13) = 2.46$, $p<.05$. The sentence formation domain scores were higher on the pre-test (M = 3.75) than the post test (M = 3.39), $t(13)$ = n.s. The mechanics domain scores showed no change between the pre-test (M = 3.52) and the post test (M = 3.52), $t(13)$ = n.s.

The post test writing samples contained more words (M = 52.71) than the pre-test writing samples (M = 45.07). The number of references to the book and/or the stories was lower on the post test (M = 2.64) than the pre-test (M = 2.71).

All 14 subjects completed the survey. As shown in Figure 4, a majority of the subjects responded with a smiling face to every question. No subjects responded with a frowning face to any of the questions.

Discussion

The subjects' improvements in the composing and style domains are important. In the rating procedure used with the Virginia Literacy Passport test, these two domains are weighted more than any other. The test designers consider the composing and style domains to be the most important aspects of writing. Therefore, the focus is on the ideas and how they are developed, not on mechanics.

This ability to write ideas down is also the first step in the writing process. The subjects demonstrated their ability to get their ideas down by using imagination, recounting Pooh's stories in detail, and mentioning other stories they have read in their letters to Pooh. They improved in the area considered to be the most crucial step in writing.

The decrease in the usage scores may seem to counter these improvements, but that is not the case. However, the two do seem to be related. Telecommunications is more informal, conversational, and narrative in style. Therefore, it is more like natural communication where the most important aspect is to get your message across. If the subjects were focusing on communication, they would not worry as much about the technical aspects of the writing.

Another possible explanation for the decrease in usage scores is the fact that the class regularly uses a writing instruction method called

Writer's Workshop. In this approach to writing, it is stressed to the students that the goal should be to get their ideas down first. They have the opportunity to go back later to edit technical errors. The subjects may have generalized the concept of writer's workshop to apply to this interaction. In writing to Pooh, the students may have been so excited about their ideas, they wanted to get them down quickly. At that point, grammar was of less importance to them in the short term.

Another important aspect of this study is the overwhelmingly positive response on the attitude survey. All of the subjects reported enjoying the use of the computer; A vast majority of them said they like both writing to and receiving letters from Pooh. These subjects seemed to genuinely enjoy writing to Pooh. Some students who had no strong feelings toward writing in general, colored a smiling face in response to the sentence about writing to Pooh specifically. Motivation is a likely by-product of this excitement and enjoyment surrounding the interaction.

For further study, I think it would be worthwhile to have the project continue throughout an entire school year. It would be interesting to see how the students' writing changes after an extended experience with this kind of purposeful writing. Also, it would be interesting to observe how the relationship between the students and the character changes over a more substanial period of time.

For the purposes of this project, students were required to write to Pooh during their computer time. It would be interesting to see the results if this were an optional writing opportunity instead. Students like to choose from several options. If they have that chance, the motivation is more clearly internal, rather than external.

Another possible course for further study is to see whether the results are different when the students work in pairs. Then, the students use all four aspects of language in the interaction. Also, the grammar aspect of their writing may be reinforced by giving them the opportunity to discuss the writing.

Overall, this interaction seemed to have a positive effect on the composing and style aspects of the subjects' writing. Another positive aspect was their attitude towards writing and the enjoyment involved in receiving responses from Pooh. With future research, projects like this could be improved and become even more effective in promoting student writing.

Appendix A

RATING SCALE

# of words _____

# of references to book/story _____

Content	1 - Weak	3 - Average	5 - Strong
1. Interest	Unclear, unimaginative writing Boring or poorly defined topic.	Understandable, but unimaginative writing. Topic adequately defined.	Imaginative, interesting writing Well-developed topic.
2. Coherence	Lack of organization or development. Unclear or missing main ideas.	Identifiable main ideas but weak organization. Some ideas missing or out of order.	Strongly defined main idea. Clear, logical organization. Sentences related to each other.
3. Unity	Many irrelevant sentences or details.	Few irrelevant sentences or details.	Well-chosen, relevant sentences or details.
4. Development	Writing so lacking in development and detail that topic is not identifiable.	Boring description. Incomplete development of narrative or exposition.	Description rich in detail. Clear, easily followed narrative or exposition.
5. Word Choice	Dull, general words, poorly chosen.	Suitable, but unimaginative language.	Specific, figurative language.

Mechanics	1 - Weak	3 - Average	5 - Strong
1. Paragraphs	Paragraph(s) not indented Improper letter form.	In writing of longer than 1 paragraph, not all paragraphs indented. Some letter form used.	Paragraphs indented. Proper use of letter form.
2. Sentences	Many fragments and run-on sentences.	Some fragments and/or run-on sentences.	Few, if any, fragments and run-on sentences.
3. Grammar	Frequent mistakes in the use of nouns, verbs, pronouns, and S-V agreement.	Occasional mistakes in the use of N, V, pronouns, and S-V agreement.	Infrequent mistakes in the use of N, V, pronoun, and S-V agreement.
4. Capitalization	Frequent mistakes in capitalization of sentence beginnings, proper nouns, I, and titles.	Occasional mistakes in capitalization.	Infrequent mistakes in capitalization.
5. Punctuation	Punctuation marks frequently missing or misused.	Infrequent mistakes in punctuation.	Punctuation marks used correctly.
6. Spelling	Frequent mistakes in spelling w/out any pattern or indication of awareness of spelling patterns.	Occasional mistakes in spelling with some awareness of spelling patterns.	Infrequent mistakes in spelling, indicating an awareness of spelling patterns.

Appendix B

Virginia Literacy Passport Test Domains	Rating Scale Categories
Composing	Interest Coherence Unity
Style	Development Word Choice
Sentence Formation	Sentences
Usage	Grammar
Mechanics	Paragraphs Capitalization Punctuation Spelling

Appendix C

NAME: _____

I like to write. 

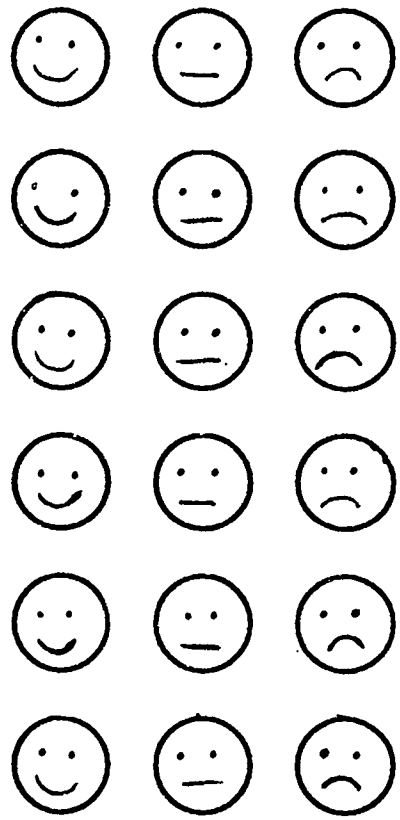
I like to read. 

I like to use the computer. 

I like Winnie the Pooh.

I like writing letters to Pooh. 

I like getting letters from Pooh. 



My favorite part about writing to Pooh is:

_____

_____

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Figure 1

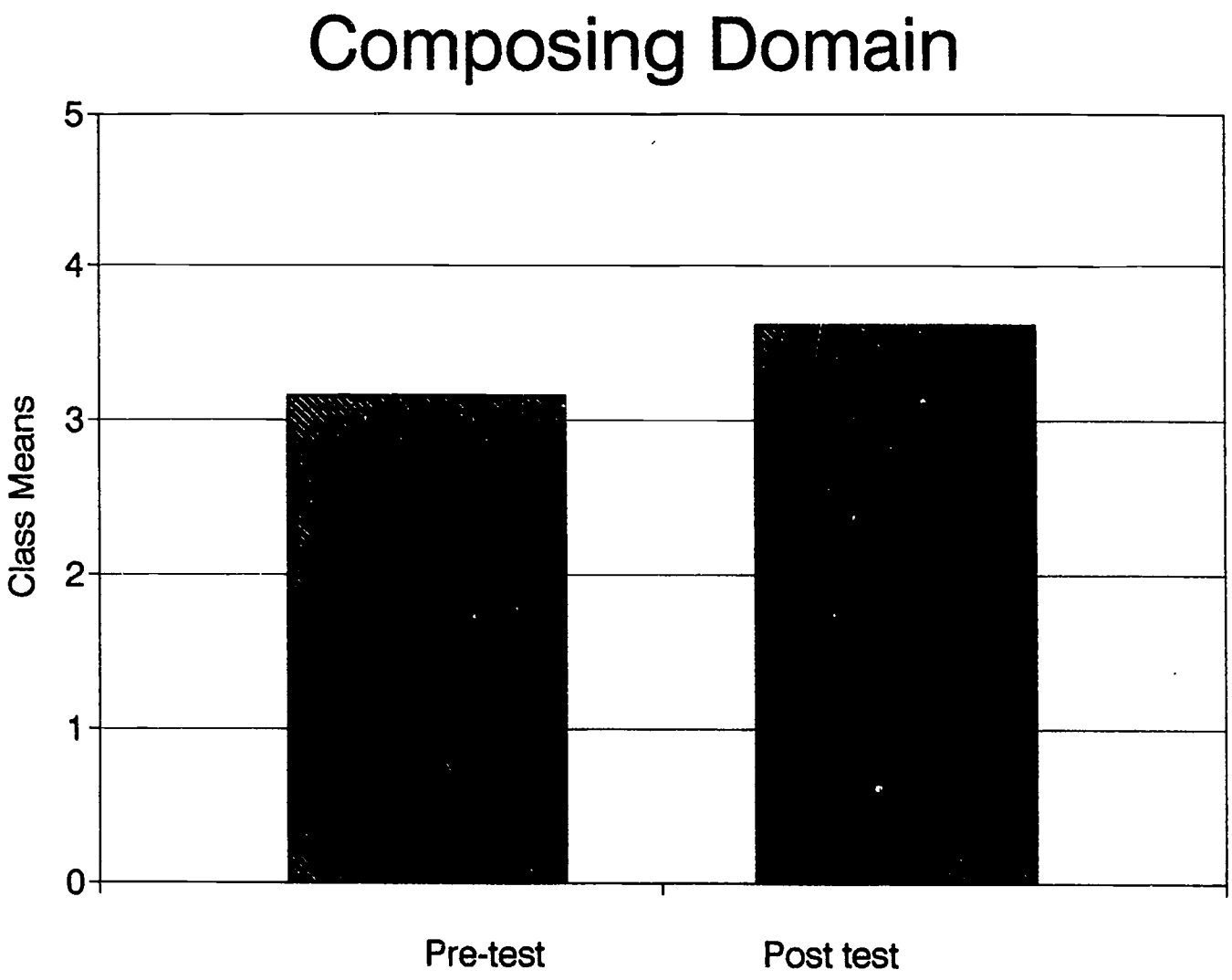

Figure 2

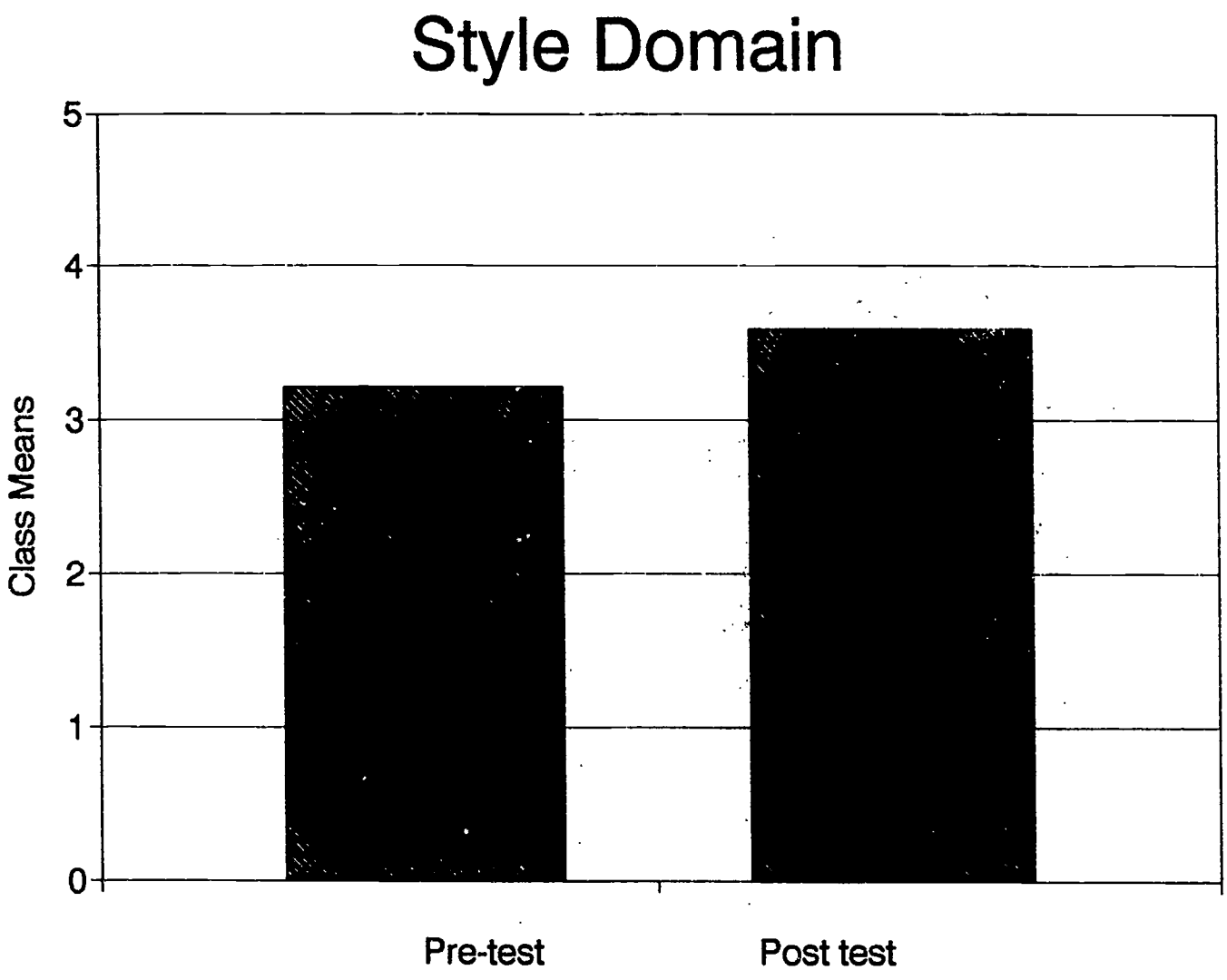

Figure 3

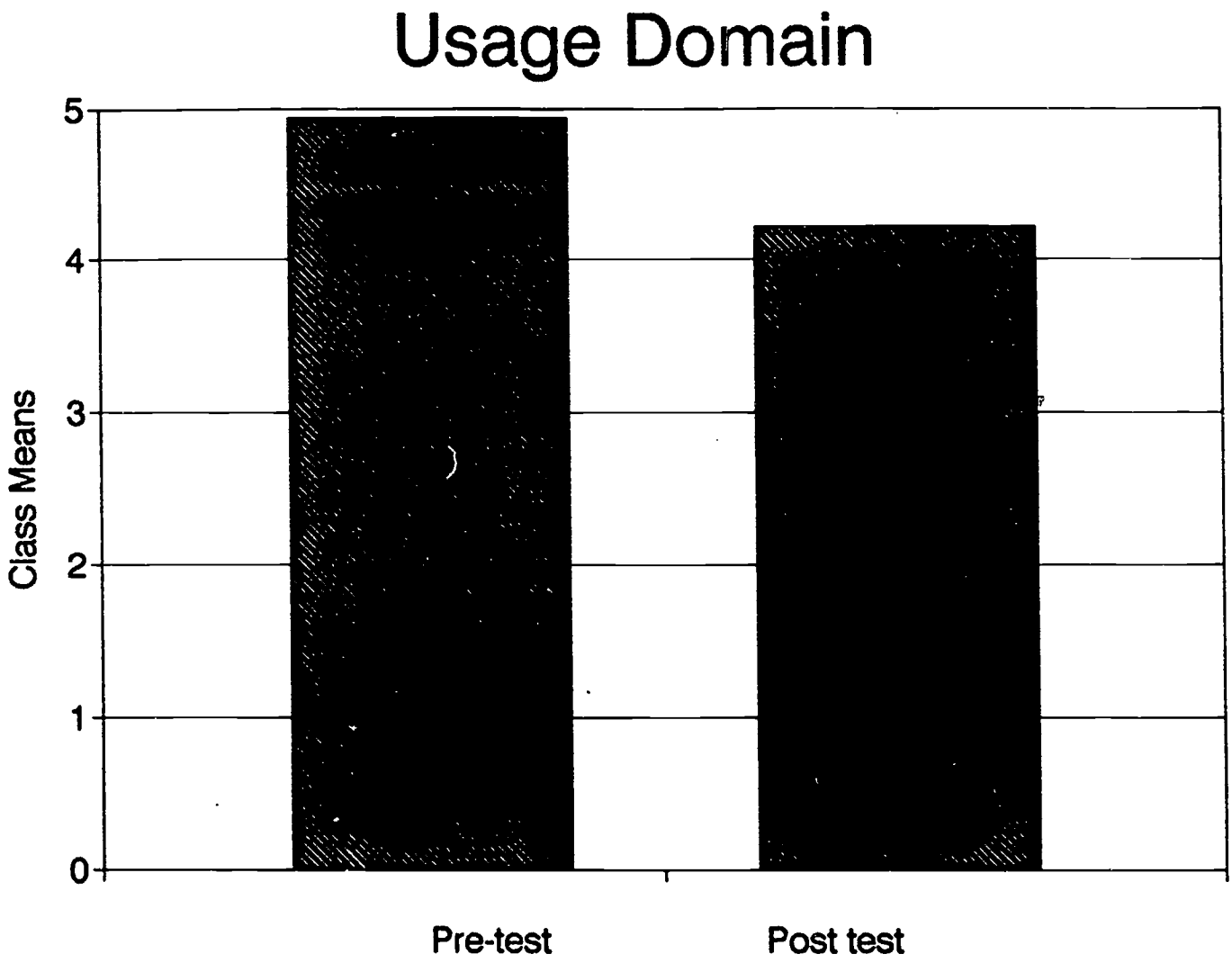

Figure 4

Results of Survey

	Smiling	Neutral	Frowning
I like to write.	9	5	0
I like to read.	10	4	0
I like to use the computer.	14	0	0
I like Winnie the Pooh.	12	2	0
I like writing letters to Pooh.	11	3	0
I like getting letters from Pooh.	13	1	0

My favorite part about writing to Pooh is:

Like the response letters (4 subjects)

Like using the computer (3 subjects)

"It is fun"

"you can ask him thing"

"acking guweshdins and tiling him thing."

"sometimes hes funny"

"making up joke's."

"When he said oh goodness."